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UK METEOROLOGICAL OFFICE GLOBAL DATA MONITORING REPORT

December, 93

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIBU observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12 UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Aircraft observations

TABLE 3 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of AIREP/ASDAR reports received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 4-6 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 4 and 5 and the weights used in the RMS values in TABLE 4.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-12. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 7 shows quality statistics for **Mean Sea-level Pressure**, **Windspeed** and **Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 8 shows quality statistics for **Temperature** and **Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 9 - 12 show quality statistics (**Geopotential Height** and **Windspeed** at **100** and **500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH:December, 1993

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (Degrees).
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa (pressure) :25 m s^{-1} (vector wind)	
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa (pressure), ≥ 5 m s^{-1} (wind speed) ≥ 30 degrees (direction).
	2.SD	≥ 6 hPa (pressure) ≥ 80 degrees (direction).
	3.PGE	≥ 25.

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
ATRK	ALL	MSLP	SUR	24	0	0	2.4	5.8	6.3
DCKF	ALL	MSLP	SUR	61	1	2	1.1	-4.3	4.4
ELFN7	ALL	MSLP	SUR	41	0	0	1.3	4.4	4.5
UYDW	ALL	MSLP	SUR	39	0	0	2.5	6.8	7.3
VRCV	ALL	MSLP	SUR	33	0	0	1.7	-5.9	6.1
VVKK	ALL	MSLP	SUR	25	0	0	1.3	8.8	8.9
V2SM	ALL	MSLP	SUR	31	0	0	2.9	-6.8	7.4
WCZB	ALL	MSLP	SUR	25	0	0	1.3	5.5	5.7
WE3806	ALL	MSLP	SUR	56	0	0	1.6	-5.8	6.0
WE4879	ALL	MSLP	SUR	45	1	2	2.3	-4.3	4.8
WZE4928	ALL	MSLP	SUR	32	32	100	0.0	0.0	0.0
13491	ALL	MSLP	SUR	131	131	100	0.0	0.0	0.0
3FGH3	ALL	MSLP	SUR	25	0	0	3.9	-4.1	5.7
3FJJ3	ALL	MSLP	SUR	25	0	0	1.1	-11.5	11.5
3FLS2	ALL	MSLP	SUR	22	0	0	1.4	-6.3	6.5
5LGK	ALL	MSLP	SUR	24	2	8	2.0	-12.0	12.1
71003	ALL	MSLP	SUR	512	512	100	0.0	0.0	0.0
74002	ALL	MSLP	SUR	550	96	17	2.1	-9.6	9.8
WIND SPEED									
DEOF	ALL	SPEED	SUR	34	0	0	5.8	5.8	8.3
DFCG	ALL	SPEED	SUR	42	0	0	5.4	8.1	9.7
ELDU4	ALL	SPEED	SUR	21	0	0	5.3	8.0	9.6
ELLE9	ALL	SPEED	SUR	54	1	2	6.3	9.4	11.3
JBCN	ALL	SPEED	SUR	44	1	2	3.2	5.0	6.0
OUEX	ALL	SPEED	SUR	24	0	0	3.7	5.0	6.2
TSLN	ALL	SPEED	SUR	27	0	0	4.9	5.9	7.7
UTNT	ALL	SPEED	SUR	29	0	0	4.1	-5.2	6.7
VMAL	ALL	SPEED	SUR	24	0	0	5.0	6.2	7.9
VRIO	ALL	SPEED	SUR	44	0	0	6.3	7.2	9.6
YJWY6	ALL	SPEED	SUR	59	0	0	3.8	5.5	6.7
Y5OX	ALL	SPEED	SUR	22	0	0	4.2	5.4	6.8
3EZH7	ALL	SPEED	SUR	103	0	0	2.7	5.2	5.8
62402	ALL	SPEED	SUR	87	2	2	3.7	5.3	6.5
63116	ALL	SPEED	SUR	27	0	0	4.5	5.2	6.9
WIND DIRECTION									
C6IF4	ALL	DIRN.	SUR	21	0	0	62.1	-47.0	77.8
ZCAV7	ALL	DIRN.	SUR	23	0	0	47.7	-32.2	57.6
32321	ALL	DIRN.	SUR	44	0	0	70.4	-41.0	81.5
42027	ALL	DIRN.	SUR	24	0	0	12.1	33.8	35.9
43001	ALL	DIRN.	SUR	52	0	0	40.2	-48.5	63.0
46027	ALL	DIRN.	SUR	55	0	0	25.9	-30.3	39.8
46053	ALL	DIRN.	SUR	37	0	0	59.3	-30.1	66.5
46054	ALL	DIRN.	SUR	63	0	0	42.1	-30.7	52.1
46131	ALL	DIRN.	SUR	44	0	0	42.6	-36.3	56.0
46146	ALL	DIRN.	SUR	51	0	0	53.6	-43.7	69.2
46147	ALL	DIRN.	SUR	74	0	0	31.1	-35.1	46.9
46181	ALL	DIRN.	SUR	58	0	0	96.7	-40.3	104.8
46183	ALL	DIRN.	SUR	38	0	0	17.0	-31.2	35.5
46204	ALL	DIRN.	SUR	91	0	0	35.1	-30.3	46.4
51006	ALL	DIRN.	SUR	64	0	0	43.7	-34.9	55.9
52004	ALL	DIRN.	SUR	35	0	0	80.4	-36.9	88.4
52006	ALL	DIRN.	SUR	75	0	0	17.7	-42.9	46.4

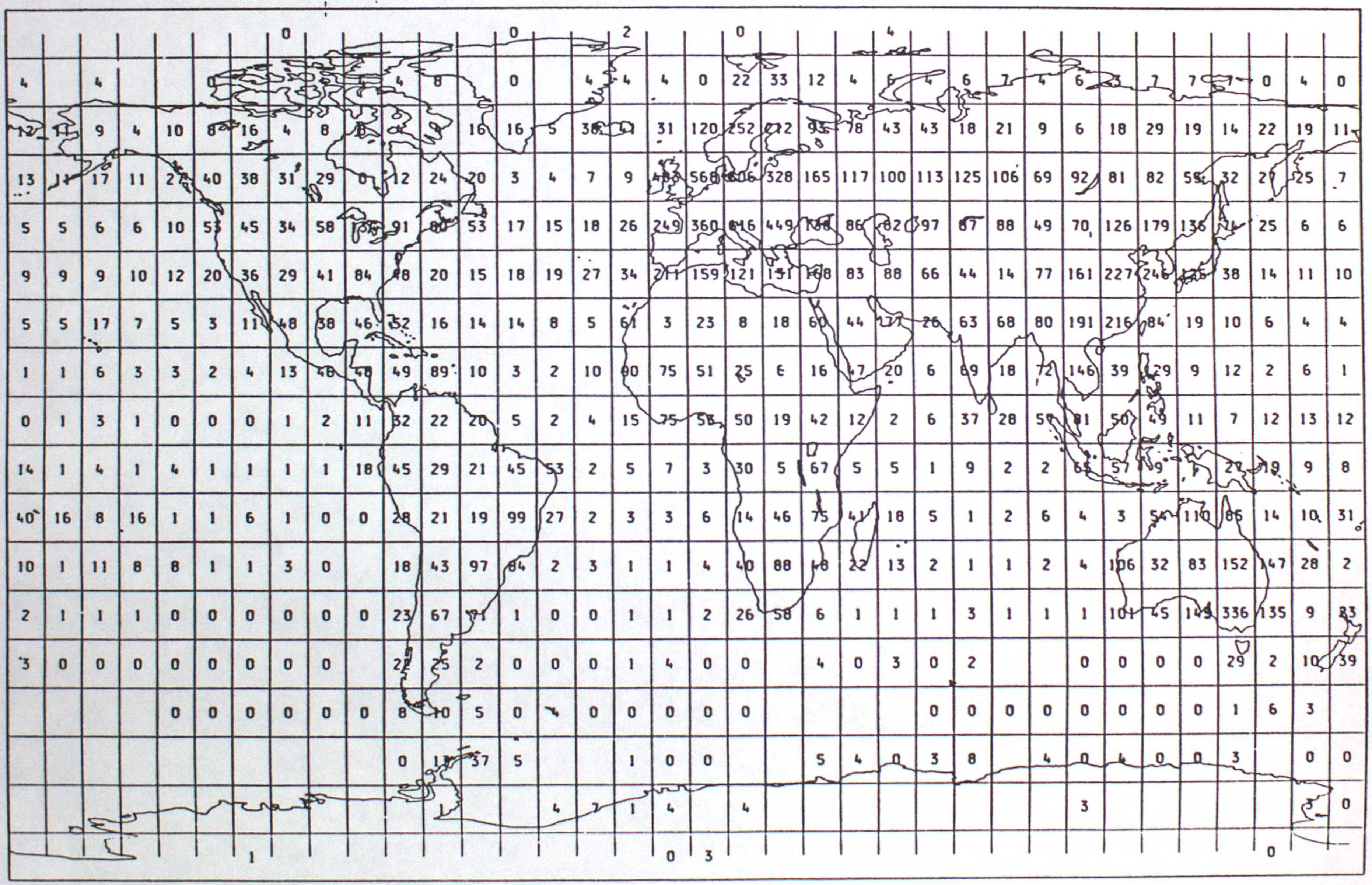
AVAILABILITY - SHIP/SYNOP - DECEMBER 1993

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 17951

FIGURE 1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0 0 0 0 0 0 8 10 5 0 4 0 0 0 0 0 0 0 0 0 0 0 0 0 1 6 3
0 13 37 5 1 0 0 5 4 0 3 8 4 0 4 0 0 3 0 0
1 4 7 1 4 4 3 3 0
1 0 3 0

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH:December, 1993

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from Bracknell global model.

Position :Average Latitude and Longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa)
:Wind speed (m s^{-1}),
:Wind direction (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA :NOBS ≥ 20 ,and one or more of the following:

1. |bias| ≥ 4 hPa (pressure).
   ≥ 5 m s^{-1} (wind speed).
   ≥ 30 degrees (direction).

2. SD ≥ 6 hPa (pressure).
   ≥ 80 degrees (direction).

3. PGE ≥ 25.

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
12501	38.8	11.3	ALL	MSLP	SUR	32	32	100	0.0	0.0	0.0
17584	-40.3	26.7	ALL	MSLP	SUR	69	42	61	2.7	9.3	9.7
44616	53.0	-37.3	ALL	MSLP	SUR	580	73	13	5.3	-4.9	7.2
53503	22.7	132.1	ALL	MSLP	SUR	41	0	0	2.5	-6.7	7.1
61543	33.1	19.6	ALL	MSLP	SUR	33	19	58	4.1	-0.4	4.2
71557	-57.6	147.4	ALL	MSLP	SUR	557	222	40	5.2	-5.4	7.5
WIND SPEED											
52521	15.4	128.6	ALL	SPEED	SUR	136	0	0	2.1	-5.2	5.6
52525	23.2	129.0	ALL	SPEED	SUR	229	0	0	1.9	-5.8	6.1
52527	16.5	125.5	ALL	SPEED	SUR	149	0	0	1.7	-5.6	5.8
55583	-36.2	171.6	ALL	SPEED	SUR	740	0	0	2.1	-5.6	6.0
WIND DIRECTION											
52521	15.4	128.6	ALL	DIRN.	SUR	136	0	0	33.2	128.9	133.1
55583	-36.2	171.6	ALL	DIRN.	SUR	469	0	0	97.0	30.7	101.7

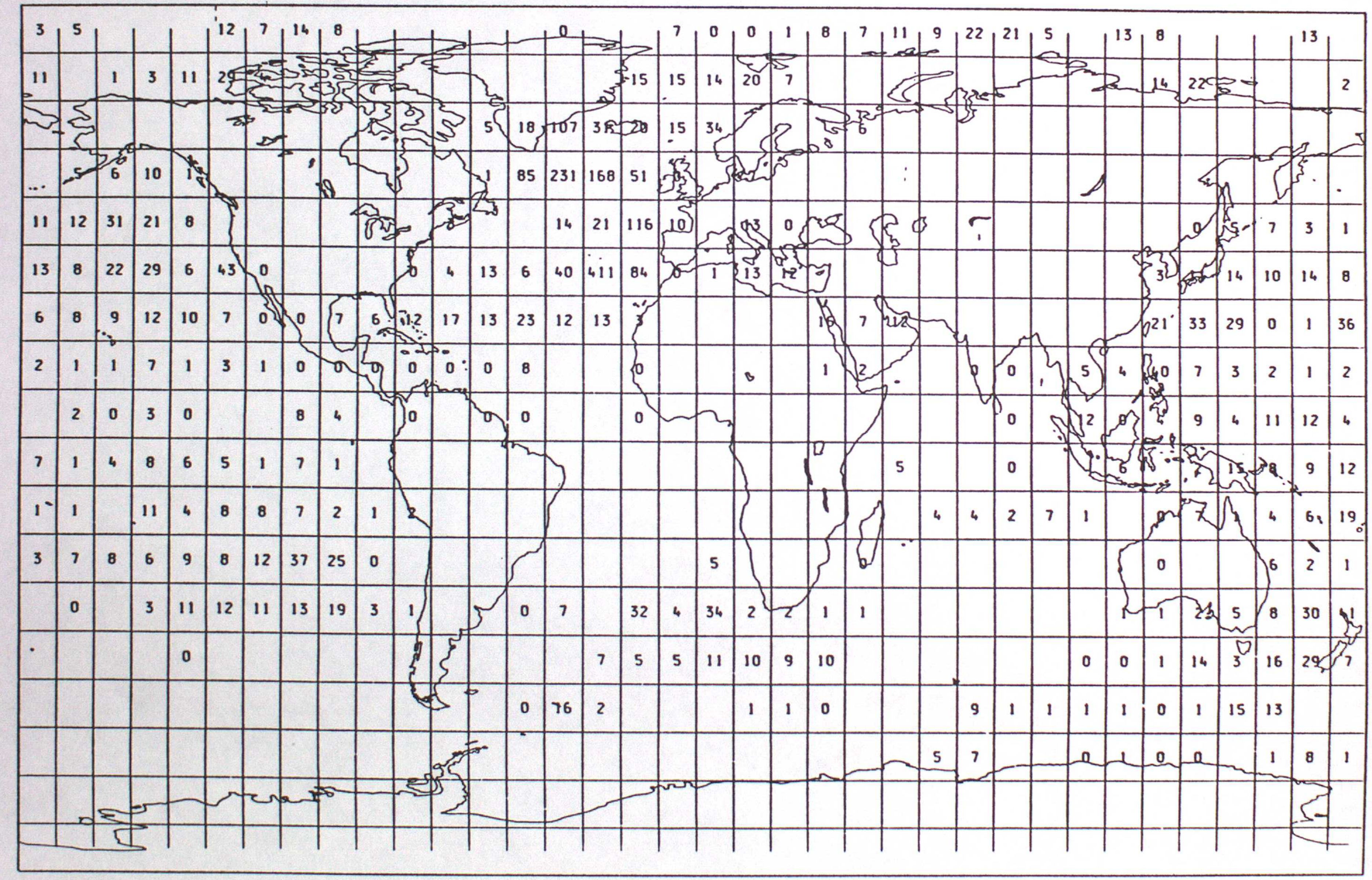
AVAILABILITY - DRIBU - DECEMBER 1993

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 3443

FIGURE 2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2 1 1 7 1 3 1 0 0 0 0 0 0 8 0 1 2 0 0 5 4 40 7 3 2 1 2
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0 7 5 5 11 10 9 10 0 0 1 14 3 16 29 7
0 76 2 1 1 0 9 1 1 1 1 0 1 15 13
5 7 0 1 0 0 1 8 1

TABLE 3

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH:December, 1993

Monitoring procedures:
Period :One calendar month.
Data monitored :Statistics for each airline carrier.
Area monitored :90°N - 90°S, 180°W - 180°E.
Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :70.0 - 500.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored :N REP.:Number of observations received excluding duplicates.
:PG :Percentage of observations with gross errors.
:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.
:PC :Percentage of observations with calm winds.
:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

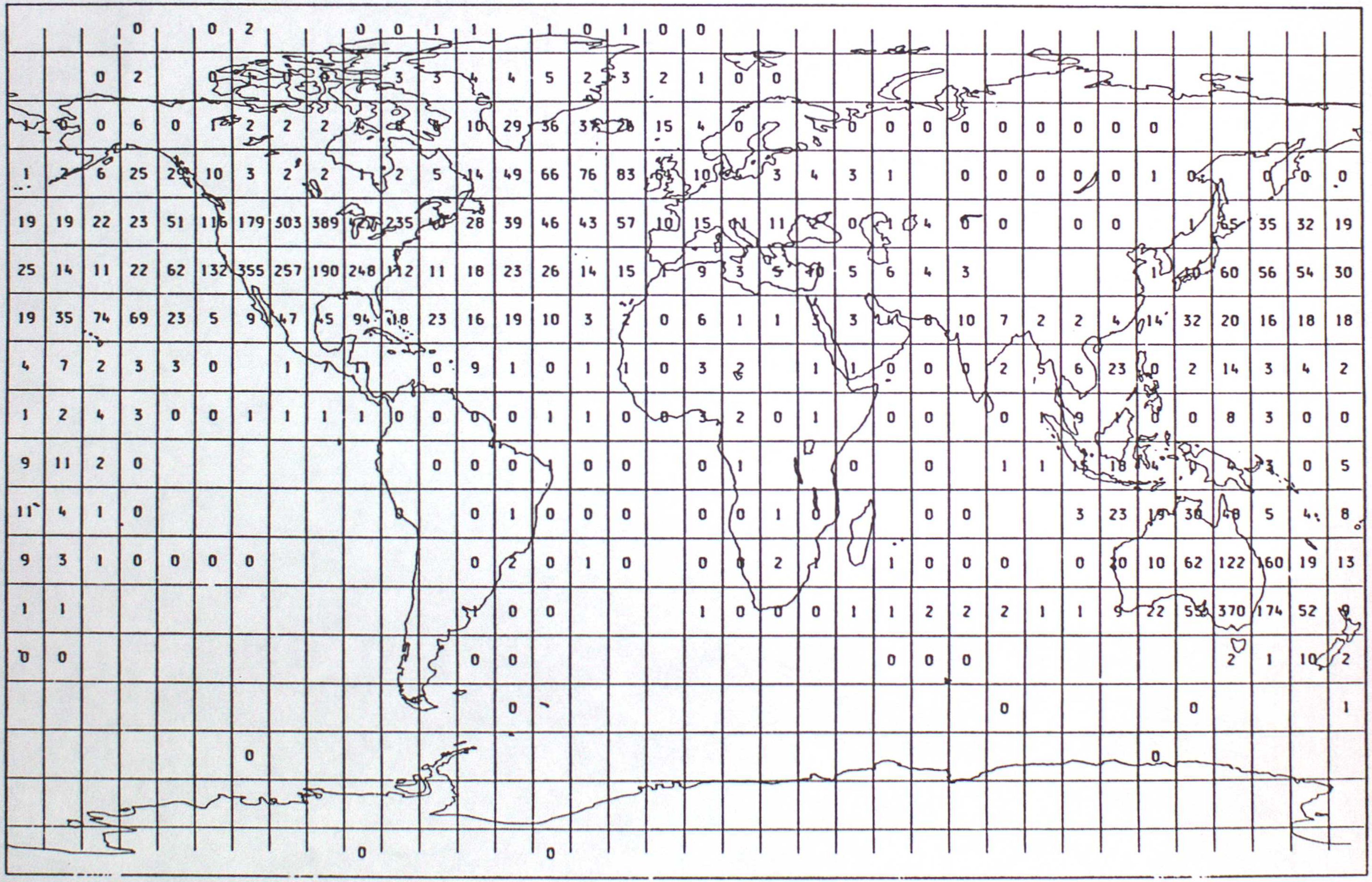
NB:- DUE TO A TEMPORARY ARCHIVING PROBLEM STATISTICS FOR IDENTIFIERS UAL, AN, BA, CO, DL, KL, NW AND QF DO NOT INCLUDE DATA BETWEEN 1500 UTC AND 2100 UTC. THIS DATA IS ALSO EXCLUDED FROM FIGURES 4 TO 7

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	94	0	2	2.1	0.5	95	0	1	0	9.2	2.0
AAL	2212	1	2	1.9	0.3	2239	0	2	0	9.6	1.9
AAR	1100	0	2	2.0	-0.3	1101	0	2	0	9.7	1.2
ACA	597	1	3	2.3	-0.5	612	0	2	0	8.3	0.8
ACI	36	0	0	1.4	0.7	36	0	3	0	8.8	1.7
ADV	30	0	0	3.3	2.8	30	0	3	0	7.8	0.0
AEA	112	1	3	2.0	-0.3	112	0	4	0	12.3	0.1
AEL	227	2	4	1.9	-0.3	232	0	3	0	9.1	1.0
AFL	106	3	100	3.3	1.6	107	1	100	0	18.6	1.1
AFR	604	0	6	2.0	-0.1	616	0	6	0	9.3	1.3
AJJ	40	3	10	3.1	-1.1	40	0	5	3	10.2	1.0
AMT	146	1	4	2.3	1.2	151	0	3	0	10.1	2.2
AMX	288	1	2	1.9	0.0	288	0	4	0	9.9	0.5
ANA	566	1	1	2.3	0.5	570	0	2	1	9.9	1.9
ANC	23	0	0	1.3	0.1	23	0	0	0	7.8	3.6
ANZ	2361	1	2	1.8	-0.2	2352	0	2	1	8.2	1.5
AOM	394	3	3	1.9	0.5	403	0	3	0	9.7	1.5
ARP	287	1	1	1.5	0.0	280	0	3	1	6.8	1.2
AUA	28	0	100	2.7	-1.1	28	0	0	0	6.1	0.9
AVA	277	1	5	2.1	0.0	278	0	5	0	10.8	1.3
AVN	29	0	0	1.0	0.0	30	0	0	0	6.2	0.1
AVY	37	0	3	2.3	-1.6	37	0	0	0	9.1	1.9
AZA	347	0	2	2.0	0.4	350	0	3	0	10.2	1.4
BAL	82	0	7	2.1	-0.3	83	0	7	0	9.8	0.0
BAW	576	0	6	1.8	0.0	583	0	6	1	8.1	1.2
BBB	24	4	13	1.6	-0.9	24	0	13	0	8.1	-2.1
BWA	356	1	2	1.9	1.1	361	0	4	0	9.6	2.6
CAL	1272	1	3	2.0	-0.1	1274	0	4	0	10.1	1.5
CCA	181	1	94	2.7	-0.3	182	1	4	0	11.6	1.9
CDN	1748	0	2	2.3	0.6	1750	0	3	0	9.2	1.9
CES	163	0	1	2.2	0.6	164	1	1	0	10.0	1.0
CFG	541	0	2	2.0	-0.9	542	0	2	0	9.5	0.5
CKS	118	2	98	2.2	0.3	122	1	98	1	13.3	3.0
CKT	31	0	16	2.1	0.7	29	0	10	0	7.9	0.3
CMI	1100	1	1	1.8	0.5	1102	0	2	1	8.2	0.9
CMM	130	1	2	1.9	-0.3	135	0	3	0	9.5	1.5
COA	459	1	3	1.8	0.3	465	0	3	1	9.5	1.7
CPA	235	0	1	2.0	-0.3	233	0	1	0	9.2	1.8
CRL	125	2	2	1.4	0.0	127	0	2	0	9.2	1.4
CTM	46	2	20	2.8	-0.2	46	0	20	0	11.1	4.2
CUB	75	11	100	3.9	0.5	75	0	17	0	13.9	3.0
DAE	33	0	0	1.9	0.0	33	0	0	0	7.4	1.6
DAL	3021	0	2	2.2	0.7	2910	0	2	0	9.0	1.7
DHL	104	1	9	3.4	-0.9	106	0	7	0	12.6	2.1
DLH	2437	0	7	2.0	-0.3	2435	0	9	2	8.4	1.2
DOA	40	3	5	2.0	-0.3	40	0	5	0	6.6	0.3
EIA	140	9	19	3.5	-1.2	146	0	11	0	12.1	2.0
ELY	55	2	9	1.5	0.5	60	0	10	0	11.9	2.2
EVA	765	0	2	2.2	-0.4	766	0	4	0	11.1	1.4
FDX	638	1	3	2.1	0.7	641	0	4	0	9.7	1.1
FIN	250	0	1	1.8	0.6	250	0	1	0	7.7	1.1
FJI	303	1	4	1.6	0.5	300	0	3	1	9.0	1.8
GIA	292	1	2	1.3	0.3	288	0	2	1	7.6	1.7
HAL	897	0	1	2.0	0.6	897	0	3	0	11.4	2.1
HLF	122	1	2	1.9	-0.8	120	0	0	0	7.9	1.8
IBE	1511	1	12	2.1	0.0	1501	0	12	0	10.0	0.5
ICE	281	0	2	2.0	0.3	281	0	2	0	8.0	0.7
JAA	35	0	0	1.6	1.2	34	0	0	0	8.9	4.3
JAL	3962	0	1	1.9	0.4	3967	0	2	0	9.2	1.2
JAS	79	1	1	1.2	0.5	78	0	1	0	6.9	0.5
JAZ	124	2	2	1.9	1.2	124	0	2	0	7.8	0.7
KAL	2382	1	4	2.5	-0.2	2385	0	2	0	9.8	1.6
KLM	1184	0	1	1.9	0.3	1181	0	2	0	8.3	1.3
LDA	175	1	8	1.8	-1.1	177	1	9	0	8.9	0.0

		TEMPERATURE				WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
LDI	85	0	5	2.1	-1.6	85	0	4	0	9.3	0.4
LIB	65	0	2	1.5	-0.5	65	0	3	0	8.1	2.4
LOT	188	1	1	1.8	0.3	187	0	2	0	7.2	0.5
LTU	527	2	4	2.2	0.3	510	0	3	0	9.6	1.4
MAH	40	0	0	1.6	-0.2	41	0	0	0	7.8	0.5
MAS	276	1	3	1.9	0.3	276	0	3	1	9.3	1.4
MAU	21	0	0	1.6	0.7	21	0	0	0	12.0	4.0
MDA	85	1	7	3.4	1.3	85	0	1	0	9.8	2.5
MPH	296	0	3	2.1	-0.2	301	0	4	1	9.9	1.0
NAL	78	1	3	1.9	1.0	78	0	1	0	10.5	1.5
NCA	487	0	1	2.0	0.3	485	0	3	1	9.7	2.1
NGA	68	1	1	1.2	0.4	68	0	1	0	10.7	0.2
NWA	7956	0	2	2.2	0.6	7989	0	2	0	9.5	1.3
PAL	695	3	3	2.2	0.1	700	0	4	2	9.8	1.2
PAO	320	2	4	1.8	0.3	318	0	2	0	7.4	1.1
QFA	1572	1	2	1.7	0.3	1569	0	3	1	8.0	1.4
RAF	112	0	0	1.9	0.4	110	0	2	2	9.6	1.9
RKA	57	2	4	1.6	0.8	57	0	11	0	12.7	2.8
RON	67	1	1	1.7	0.6	67	0	6	4	6.6	1.7
RRR	44	5	20	2.7	0.2	46	0	30	4	11.0	1.9
SAA	174	0	1	2.1	-0.7	174	0	1	0	10.2	0.9
SAS	1151	0	1	1.7	0.0	1147	0	2	1	7.1	0.4
SIA	971	0	2	2.1	-0.3	970	0	5	1	10.3	1.2
SJM	24	0	4	3.1	-0.8	24	0	8	0	18.2	0.6
SOL	72	4	4	1.0	0.0	71	0	1	0	7.7	1.3
SPP	125	1	3	1.9	-0.4	117	0	2	0	9.1	0.8
SSR	23	0	0	1.8	1.4	23	0	0	0	7.8	2.5
SVA	56	0	2	1.6	0.4	61	0	5	0	10.6	-0.3
SWR	219	2	7	1.9	-0.1	210	0	6	0	9.6	1.8
TAP	410	2	5	2.3	-0.4	412	0	4	0	10.6	0.9
THA	233	1	1	2.0	-0.4	235	0	3	1	9.7	0.7
TOW	61	2	7	2.2	0.3	62	0	8	0	9.1	1.4
TWA	688	1	2	2.0	0.6	688	0	2	0	9.9	1.3
UAL	52824	1	3	1.7	0.1	52808	0	2	0	9.1	1.5
ULE	117	2	2	1.8	0.0	120	0	3	0	9.2	0.6
UPS	496	1	12	2.4	-0.7	499	0	10	0	9.8	1.7
VIA	384	0	5	1.6	0.3	387	0	6	0	8.6	1.3
VIR	28	0	0	1.5	-0.2	31	0	3	0	10.7	3.7
VRG	48	4	4	2.1	-0.4	48	0	0	0	8.4	1.7
VSP	76	1	3	2.4	0.5	76	0	0	0	9.1	1.7
AN	22948	0	1	1.4	0.2	22730	0	1	0	9.5	1.8
BA	9420	0	8	1.8	0.6	9396	1	8	0	10.8	1.7
DL	462	2	100	3.4	0.4	462	83	100	0	47.5	-7.2
KL	4081	0	69	2.4	1.6	4069	0	4	0	10.9	1.8
LH	448	0	1	2.0	-0.1	446	0	3	1	9.0	1.9
NW	32123	0	1	1.7	0.2	32084	0	1	0	8.6	1.4
QF	8283	0	1	1.3	0.2	8274	0	1	0	9.2	1.1
M	78	1	99	2.6	0.6	78	0	4	0	9.3	0.0
N	227	5	5	2.5	0.4	238	0	2	0	9.7	1.4

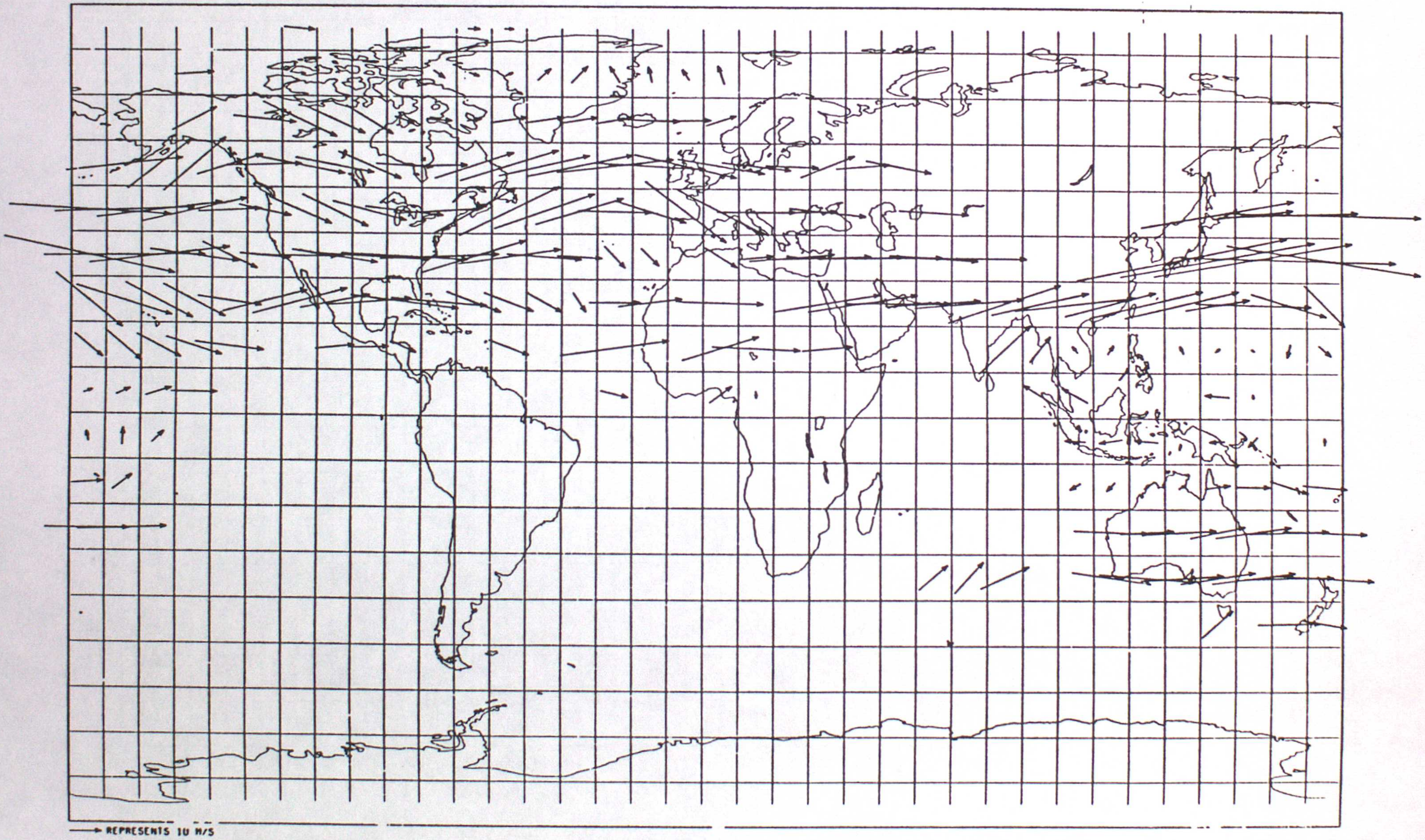
MEAN DAILY COUNT OF AIRCRAFT 70 - 500 HPA
DECEMBER 1993
OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED

FIGURE 3



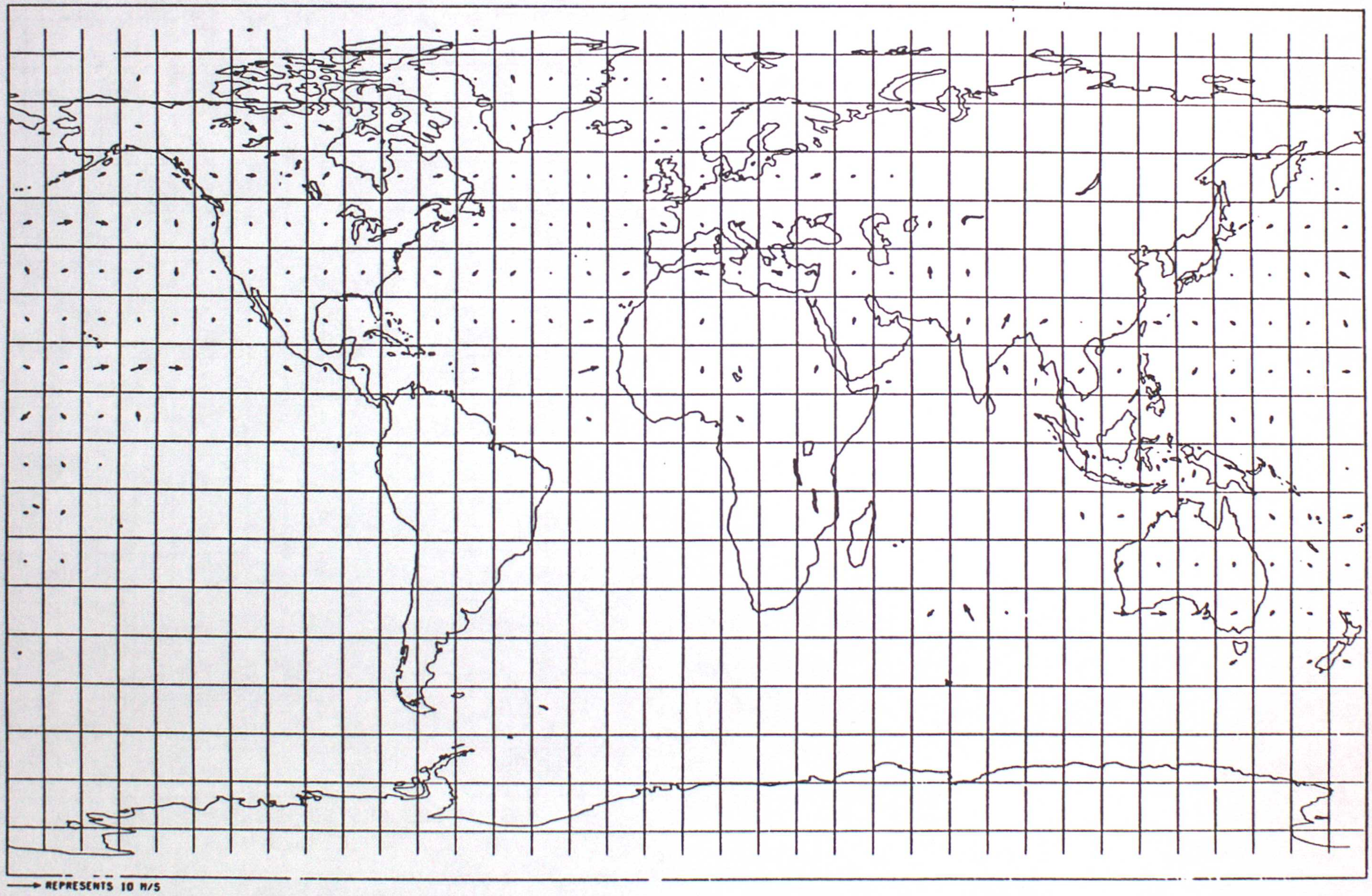
AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA
DECEMBER 1993
OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 4

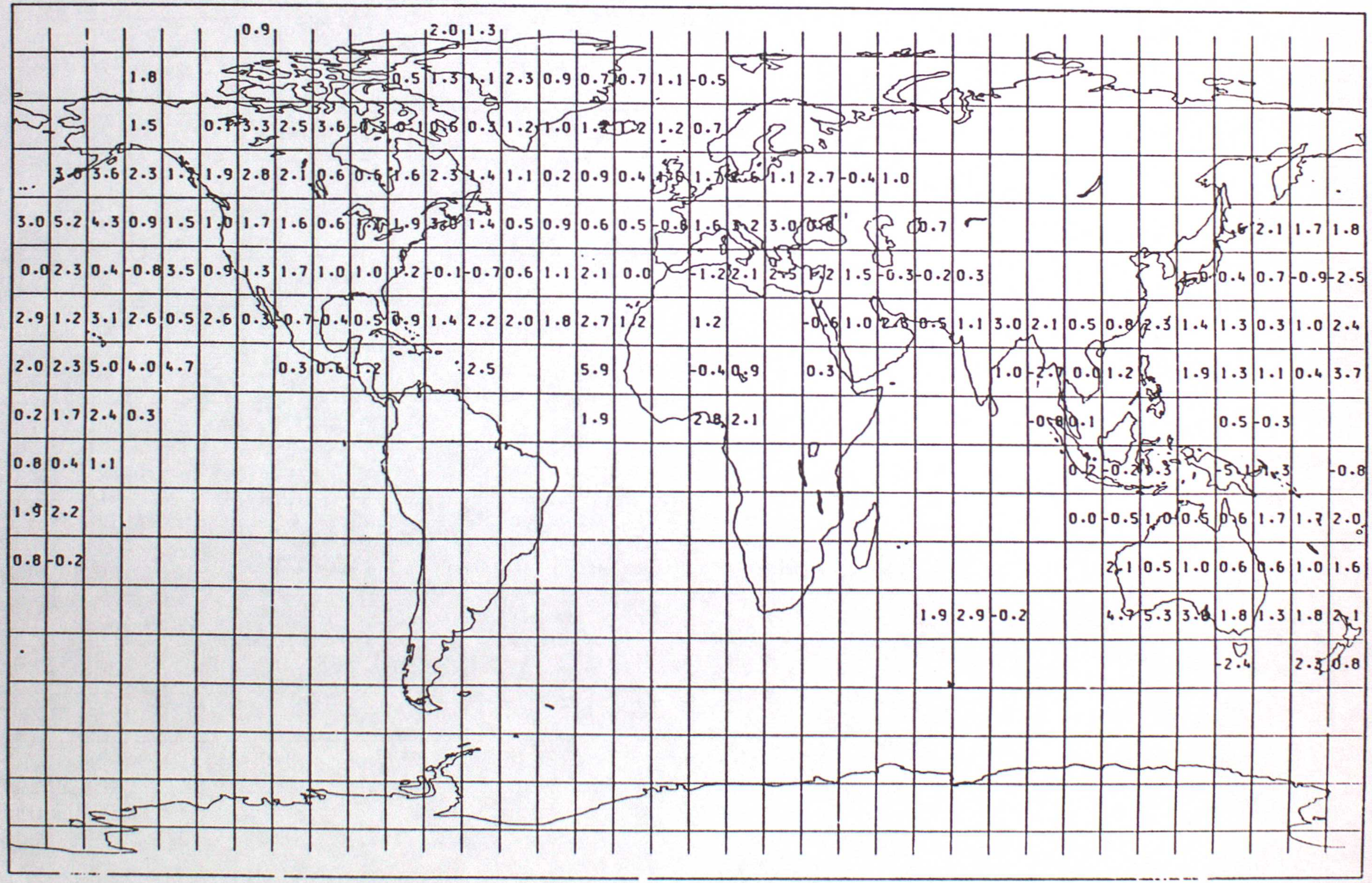


AIRCRAFT MEAN O-B WINDS BETWEEN 70 AND 500 HPA
DECEMBER 1993
OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 5



AIRCRAFT : MEAN O-B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
DECEMBER 1993
OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


0.9 2.0 1.3
1.8 0.5 1.3 1.1 2.3 0.9 0.7 0.7 1.1 -0.5
1.5 0.1 3.3 2.5 3.6 -0.3 -0.1 0.6 0.3 1.2 1.0 1.2 1.2 1.2 0.7
3.0 3.6 2.3 1.2 1.9 2.8 2.1 0.6 0.6 1.6 2.3 1.4 1.1 0.2 0.9 0.4 1.6 1.7 2.6 1.1 2.7 -0.4 1.0
3.0 5.2 4.3 0.9 1.5 1.0 1.7 1.6 0.6 1.7 1.9 3.0 1.4 0.5 0.9 0.6 0.5 -0.8 1.6 3.2 3.0 0.8 0.7 1.6 2.1 1.7 1.8
0.0 2.3 0.4 -0.8 3.5 0.9 1.3 1.7 1.0 1.0 1.2 -0.1 -0.7 0.6 1.1 2.1 0.0 -1.2 2.1 2.5 1.2 1.5 -0.3 -0.2 0.3 1.0 0.4 0.7 -0.9 -2.5
2.9 1.2 3.1 2.6 0.5 2.6 0.3 -0.7 -0.4 0.5 0.9 1.4 2.2 2.0 1.8 2.7 1.2 1.2 -0.6 1.0 2.8 0.5 1.1 3.0 2.1 0.5 0.8 2.3 1.4 1.3 0.3 1.0 2.4
2.0 2.3 5.0 4.0 4.7 0.3 0.6 1.2 2.5 5.9 -0.4 0.9 0.3 1.0 -2.7 0.0 1.2 1.9 1.3 1.1 0.4 3.7
0.2 1.7 2.4 0.3 1.9 2.8 2.1 -0.8 0.1 0.5 -0.3
0.8 0.4 1.1 0.2 -0.2 1.3 -5.1 1.3 -0.8
1.9 2.2 0.0 -0.5 1.0 0.5 0.6 1.7 1.7 2.0
0.8 -0.2 2.1 0.5 1.0 0.6 0.6 1.0 1.6
1.9 2.9 -0.2 4.7 5.3 3.8 1.8 1.3 1.8 2.1
-2.4 2.3 0.8

AIRCRAFT : RMS O-B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
DECEMBER 1993
OBSERVATIONS WITH RMSVW DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

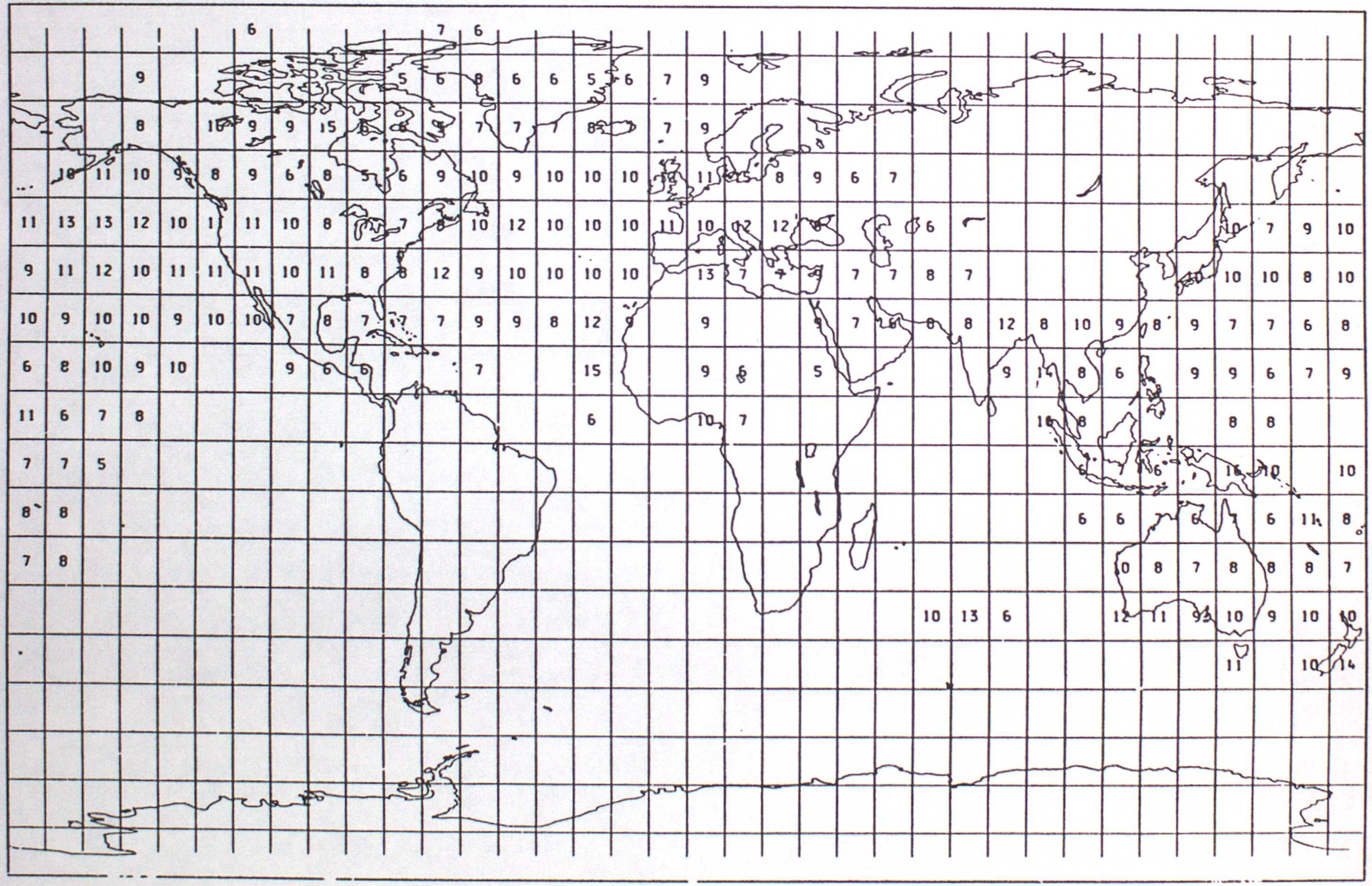

6 7 6
9 5 6 8 6 6 5 6 7 9
8 10 9 9 15 6 6 5 7 7 7 8 7 9
10 11 10 9 8 9 6 8 5 6 9 10 9 10 10 10 10 11 8 9 6 7
11 13 13 12 10 11 11 10 8 7 8 10 12 10 10 10 11 10 12 12 8 6 10 7 9 10
9 11 12 10 11 11 11 10 11 8 8 12 9 10 10 10 10 13 7 4 9 7 7 8 7 10 10 8 10
10 9 10 10 9 10 10 7 8 7 7 7 9 9 8 12 9 9 9 7 6 8 8 12 8 10 9 8 9 7 7 6 8
6 8 10 9 10 9 6 6 7 15 9 6 5 9 14 8 6 9 9 6 7 9
11 6 7 8 6 10 7 16 8 8 8
7 7 5 6 7 6 16 10 10
8 8 6 6 7 6 7 6 11 8
7 8 10 8 7 8 8 8 7
10 13 6 12 11 9 10 9 10 10
11 10 14

TABLE 4

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH:December, 1993

Monitoring procedures:

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 30.0 hPa

Element monitored :GEOPOTENTIAL HEIGHT IN metres

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.1

SELECTION CRITERIA :$\geq$ 3 levels with $\geq$ 10 observations and $\geq$ 100 m weighted RMS.

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

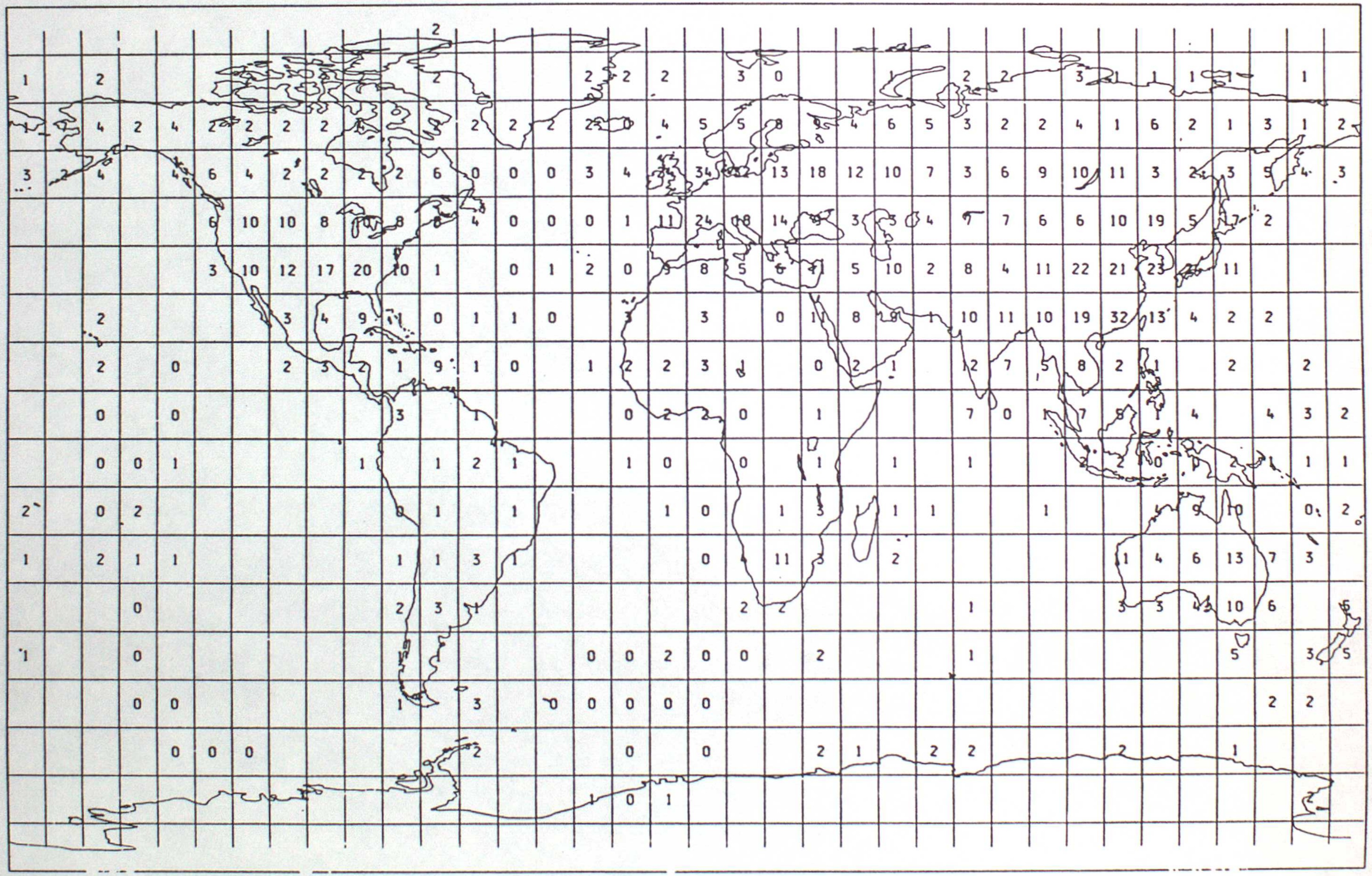
WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
26258	12	Z	200	58/ 28	30	0	98.2	37.1	105.0	8
26702	12	Z	30	55/ 21	10	0	63.0	195.5	205.4	7
33946	12	Z	50	45/ 34	21	0	69.2	165.7	179.6	5
37985	00	Z	250	39/ 49	13	0	50.2	67.1	83.8	4
41594	00	Z	400	32/ 73	7	4	23.3	-109.9	112.3	4
41977	00	Z	200	22/ 92	23	0	55.6	-100.5	114.9	7
42027	00	Z	200	34/ 75	23	0	78.5	-44.8	90.4	6
42027	12	Z	300	34/ 75	14	0	56.4	57.5	80.6	4
42101	12	Z	200	30/ 76	12	0	92.2	22.1	94.8	4
42182	00	Z	70	29/ 77	23	1	191.9	-44.1	196.9	8
42182	12	Z	150	29/ 77	25	1	132.6	6.1	132.7	8
42339	00	Z	150	26/ 73	18	2	130.7	-61.7	144.6	5
42339	12	Z	150	26/ 73	14	1	122.7	-31.5	126.7	6
42361	00	Z	30	26/ 78	9	1	265.3	50.0	269.9	8
42361	12	Z	200	26/ 78	14	1	103.0	-46.2	112.9	5
42369	00	Z	100	27/ 81	25	0	151.0	-101.0	181.7	8
42369	12	Z	100	27/ 81	16	0	142.3	-89.6	168.1	8
42379	00	Z	70	27/ 83	19	0	210.6	51.7	216.9	8
42379	12	Z	200	27/ 83	17	2	118.3	-24.2	120.7	11
42397	12	Z	700	27/ 88	25	0	15.4	-43.1	45.8	4
42410	00	Z	50	26/ 92	22	2	171.1	56.5	180.2	7
42410	12	Z	150	26/ 92	16	0	119.4	-27.6	122.5	7
42492	12	Z	200	26/ 85	16	0	89.5	-50.0	102.6	4
42647	00	Z	50	23/ 73	15	0	235.2	-79.0	248.1	6
42647	12	Z	70	23/ 73	16	1	180.4	48.3	186.7	8
42724	00	Z	200	24/ 91	10	0	80.9	69.4	106.6	4
42809	00	Z	30	23/ 88	12	1	191.9	105.1	218.8	6
42809	12	Z	70	23/ 88	20	1	102.6	-105.4	147.2	4
42867	00	Z	50	21/ 79	18	1	221.4	12.2	221.8	7
42971	00	Z	30	20/ 86	11	2	209.8	198.6	288.9	8
42971	12	Z	150	20/ 86	20	2	74.8	-100.9	125.6	6
43003	00	Z	200	19/ 73	10	0	93.7	-43.3	103.2	4
43003	12	Z	150	19/ 73	19	1	121.8	-1.3	121.8	6
43014	12	Z	200	20/ 75	6	4	71.3	117.5	137.4	6
43041	00	Z	200	19/ 82	18	0	102.9	13.7	103.8	4
43128	00	Z	50	17/ 78	10	1	203.6	108.7	230.8	7
43128	12	Z	250	17/ 78	21	2	103.0	7.1	103.3	8
43150	00	Z	250	18/ 83	28	0	79.9	14.5	81.2	7
43150	12	Z	200	18/ 83	24	1	90.2	21.3	92.7	6
43185	00	Z	50	16/ 81	13	1	198.4	123.7	233.8	7
43185	12	Z	150	16/ 81	24	2	130.8	41.8	137.3	7
43192	00	Z	100	15/ 74	11	0	157.6	-72.8	173.6	5
43192	12	Z	70	15/ 74	9	1	184.7	24.2	186.3	7
43279	00	Z	70	13/ 80	16	0	135.2	-148.4	200.7	7
43279	12	Z	50	13/ 80	11	0	160.4	111.5	195.3	7
43285	00	Z	70	13/ 75	11	2	177.6	-56.5	186.3	9
43285	12	Z	30	13/ 75	8	2	106.5	237.2	260.1	7
43295	00	Z	70	13/ 78	11	1	135.5	93.5	164.6	5
43295	12	Z	70	13/ 78	12	0	121.3	116.7	168.4	5
43311	12	Z	150	11/ 73	14	2	117.7	81.3	143.0	5
43333	00	Z	70	12/ 93	8	2	212.4	16.3	213.0	5
43333	12	Z	200	12/ 93	16	0	99.5	-51.1	111.9	4
43346	00	Z	70	11/ 80	14	0	189.4	-56.5	197.7	5
43346	12	Z	100	11/ 80	18	0	138.4	61.1	151.2	5
43353	00	Z	100	10/ 76	11	1	160.0	8.3	160.3	5
43353	12	Z	100	10/ 76	13	1	147.0	78.2	166.5	7
43369	00	Z	50	8/ 73	11	1	196.8	14.1	197.3	4
43369	12	Z	30	8/ 73	10	2	177.4	156.1	236.3	7
43371	00	Z	70	8/ 77	16	4	202.9	-72.6	215.5	9
43371	12	Z	150	8/ 77	23	3	128.3	-41.5	134.8	7
44288	00	Z	250	46/ 103	9	3	71.5	115.3	135.7	5
56739	12	Z	70	25/ 98	27	0	44.6	137.3	144.4	4
56964	00	Z	70	23/ 101	24	0	60.4	132.0	145.1	4

```
 WMO  OBS                            NUM   NUM                            NUM
IDENT TIME ELM   LEV    LAT/LONG    OBS  GROSS      SD    BIAS     RMS  LEVELS

59981  00   Z    100     17/ 112     25     0     49.5   125.6   135.0    5
60360  12   Z    500     37/   8      1    10      0.0  -132.0   132.0    4
61831  12   Z    500     10/ -14      2     8      1.0  -148.0   148.0    5
61902  12   Z     70     -8/ -14      8     3    112.8   126.2   169.3    5
62306  12   Z     50     31/  27      6     4     22.1   374.7   375.3    8
62378  12   Z    100     30/  31     10     1     32.1   220.1   222.4    6
67774  00   Z    150    -18/  31     17     0     37.8    90.7    98.3    4

68240  12   Z    150    -24/  26     19     0     88.5    62.1   108.1    6
70414  00   Z    100     53/ 174      8     0     27.9   132.6   135.5    5
83208  12   Z     50    -13/ -60     11     0     43.9   133.9   140.9    4
```

AVAILABILITY - TEMP - 500 HPA GEOPOTENTIAL - DECEMBER 1993 FIGURE 8
ALL HOURS
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS - 1381


2
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1 4 2 4 2 2 2 2 4 2 2 2 2 2 0 4 5 5 8 9 4 6 5 3 2 2 4 1 6 2 1 3 1 2
3 2 4 4 6 4 2 2 2 2 6 0 0 0 3 4 2 34 32 13 18 12 10 7 3 6 9 10 11 3 2 3 5 4 3
6 10 10 8 10 8 8 4 0 0 0 1 11 24 18 14 9 3 3 4 7 7 6 6 10 19 5 7 2
3 10 12 17 20 10 1 0 1 2 0 9 8 5 6 1 5 10 2 8 4 11 22 21 23 2 11
2 3 4 9 1 0 1 1 0 3 3 0 1 8 9 1 10 11 10 19 32 13 4 2 2
2 0 2 3 2 1 9 1 0 1 2 2 3 1 0 2 1 12 7 5 8 2 1 2 2
0 0 3 1 0 2 2 0 1 7 0 1 7 8 1 4 4 3 2
0 0 1 1 1 2 1 1 0 0 1 1 1 2 2 0 0 2 1 1 1
2 0 2 0 1 1 1 0 1 3 1 1 1 1 4 9 10 0 2
1 2 1 1 1 1 3 1 0 4 11 3 2 1 4 6 13 7 3
0 2 3 1 2 2 1 3 3 4 10 6 5
1 0 1 1 0 0 2 0 0 2 1 5 3 5
0 0 1 3 0 0 0 0 0 2 2
0 0 0 2 0 0 2 1 2 2 2 1
1 0 1 2

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH:December, 1993

Monitoring procedures:
Period :One calendar month.
Data monitored :Reports from each unique identifier for radiosonde TEMPs.
Area monitored :90°N - 90°S, 180°W - 180°E.
Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored
:NUM OBS :Number of observations available at level shown during period.
:NUM GROSS :Number of gross errors at level shown during period.
:% REJ :Percentage of observations rejected by quality control at level shown during period.
:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA :$\geq$ 10 observations and $\geq$ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa
WITH HIGHEST RMS IS SHOWN

```
 WMO  OBS                             NUM   NUM     %
IDENT TIME ELM  LEV    LAT/LONG  OBS  GROSS  REJ  UBIAS   VBIAS    RMS  LEVELS

15480  00   V   200    44/  29    23     0    13  -17.1    -1.2   19.9     4
41780  00   V   200    25/  67    18     0     0  -11.8    -1.8   15.7     2
42339  00   V   200    26/  73    21     1    13    6.4     2.7   17.2     1
42369  12   V   150    27/  81    20     0    15   -1.4     1.2   18.4     2
42379  12   V   100    27/  83    13     0     0   -4.3    -2.0   15.2     1

58725  00   V   250    27/ 117    25     0    16    5.6    -2.1   18.6     3
58725  12   V   150    27/ 117    25     0    16    6.5    -0.6   19.0     1
85201  12   V   150   -17/ -68    14     0    28   -5.8    -4.4   19.8     4
87418  12   V   200   -33/ -69    16     0   100    3.7     0.0   17.1     1
```

AVAILABILITY - TEMP/PILOT - 300 HPA WIND - DECEMBER 1993

FIGURE 9

ALL HOURS
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS - 1210

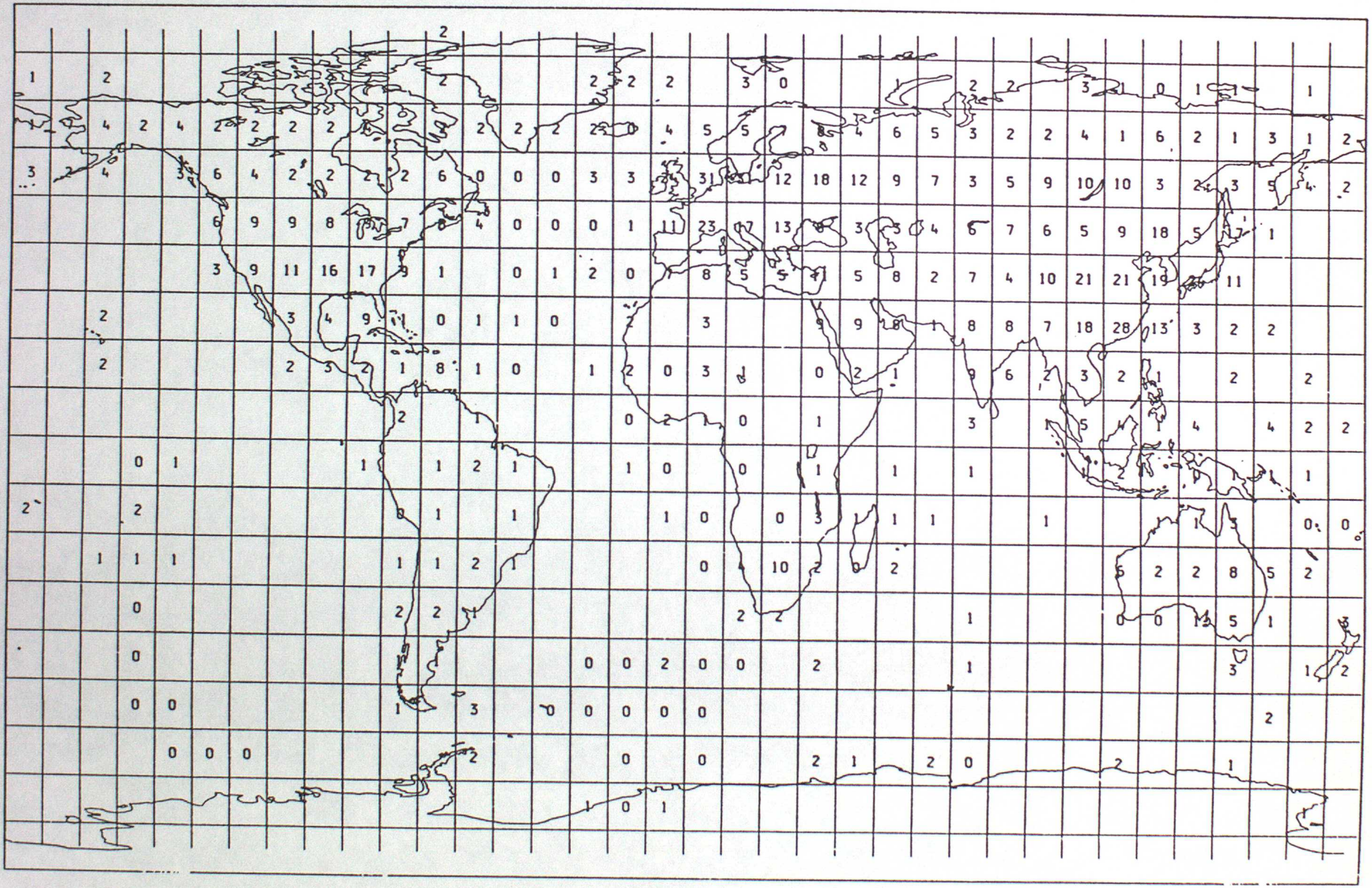

2
1 2 2 2 2 2 2 3 0 1 2 2 3 1 0 1 1 1
1 4 2 4 2 2 2 2 4 3 2 2 2 23 0 4 5 5 7 8 4 6 5 3 2 2 4 1 6 2 1 3 1 2
3 2 4 3 6 4 2 2 2 2 6 0 0 0 3 3 24 31 5 12 18 12 9 7 3 5 9 10 10 3 2 3 5 4 2
6 9 9 8 13 7 8 4 0 0 0 1 11 23 17 13 8 3 3 4 6 7 6 5 9 18 5 7 1
3 9 11 16 17 9 1 0 1 2 0 7 8 5 5 1 5 8 2 7 4 10 21 21 19 11
2 3 4 9 1 0 1 1 0 2 3 9 9 8 1 8 8 7 18 28 13 3 2 2
2 2 3 2 1 8 1 0 1 2 0 3 1 0 2 1 9 6 2 3 2 1 2 2
2 1 0 2 1 0 1 3 1 5 4 1 4 4 2 2
0 1 1 1 2 1 1 0 0 1 1 1 1 2 1
2 2 0 1 1 1 0 0 3 1 1 1 1 1 3 0 0
1 1 1 1 1 2 1 0 4 10 2 0 2 6 2 2 8 5 2
0 2 2 1 2 2 1 0 0 13 5 1 3
0 1 0 0 2 0 0 2 1 3 1 2
0 0 1 3 0 0 0 0 0 2
0 0 0 2 0 0 2 1 2 0 2 1
1 0 1

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH:December, 1993

Monitoring procedures:

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 500.0 - 150.0 hPa

Element monitored :WIND DIRECTION in degrees

Parameters monitored

:NUM OBS :Average number of observations at all levels.

:BIAS :Mean difference of observations from background values from all levels.

:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels.

:SD :SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
24641	00	DD	64/ 122	20	10.4	2.2	10.0
28952	00	DD	53/ 64	26	-25.1	6.8	10.8
28952	12	DD	53/ 64	28	-23.5	5.3	10.9
35108	00	DD	51/ 51	22	-16.4	8.1	19.7
38457	00	DD	41/ 69	28	-13.4	5.1	13.7
38687	00	DD	39/ 64	24	-11.0	1.7	19.6
41977	00	DD	22/ 92	20	46.6	9.8	21.3
42397	00	DD	27/ 88	7	11.1	9.2	9.2
42867	00	DD	21/ 79	23	-13.1	4.2	11.2
43192	00	DD	15/ 74	6	-10.2	7.4	21.9
60630	12	DD	27/ 2	27	10.7	7.3	15.6
61831	12	DD	10/ -14	8	12.2	9.9	25.6

MONITORING OF SATELLITE WINDS

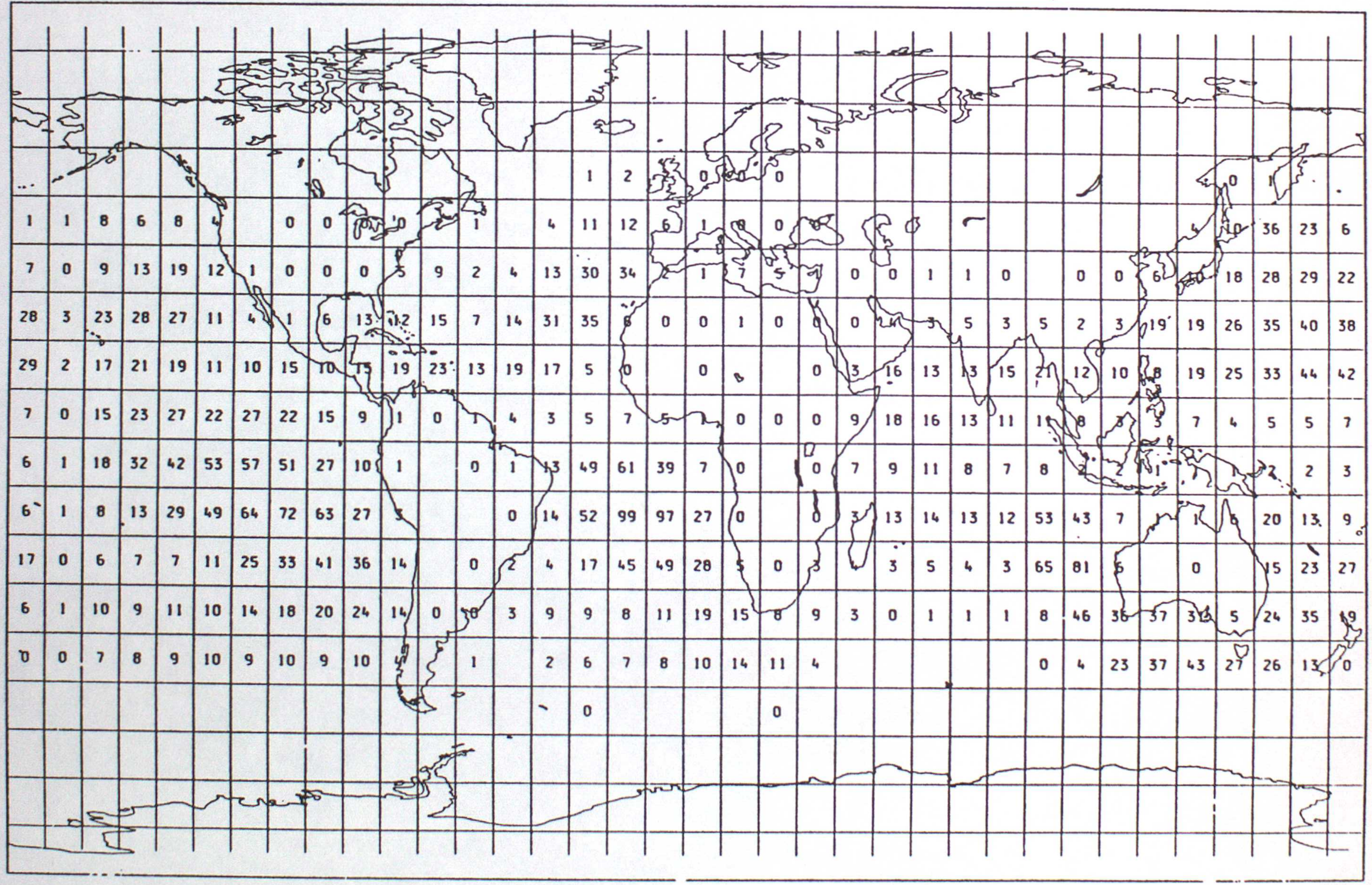
MONITORING CENTRE: BRACKNELL

MONTH:December, 1993

Monitoring procedures

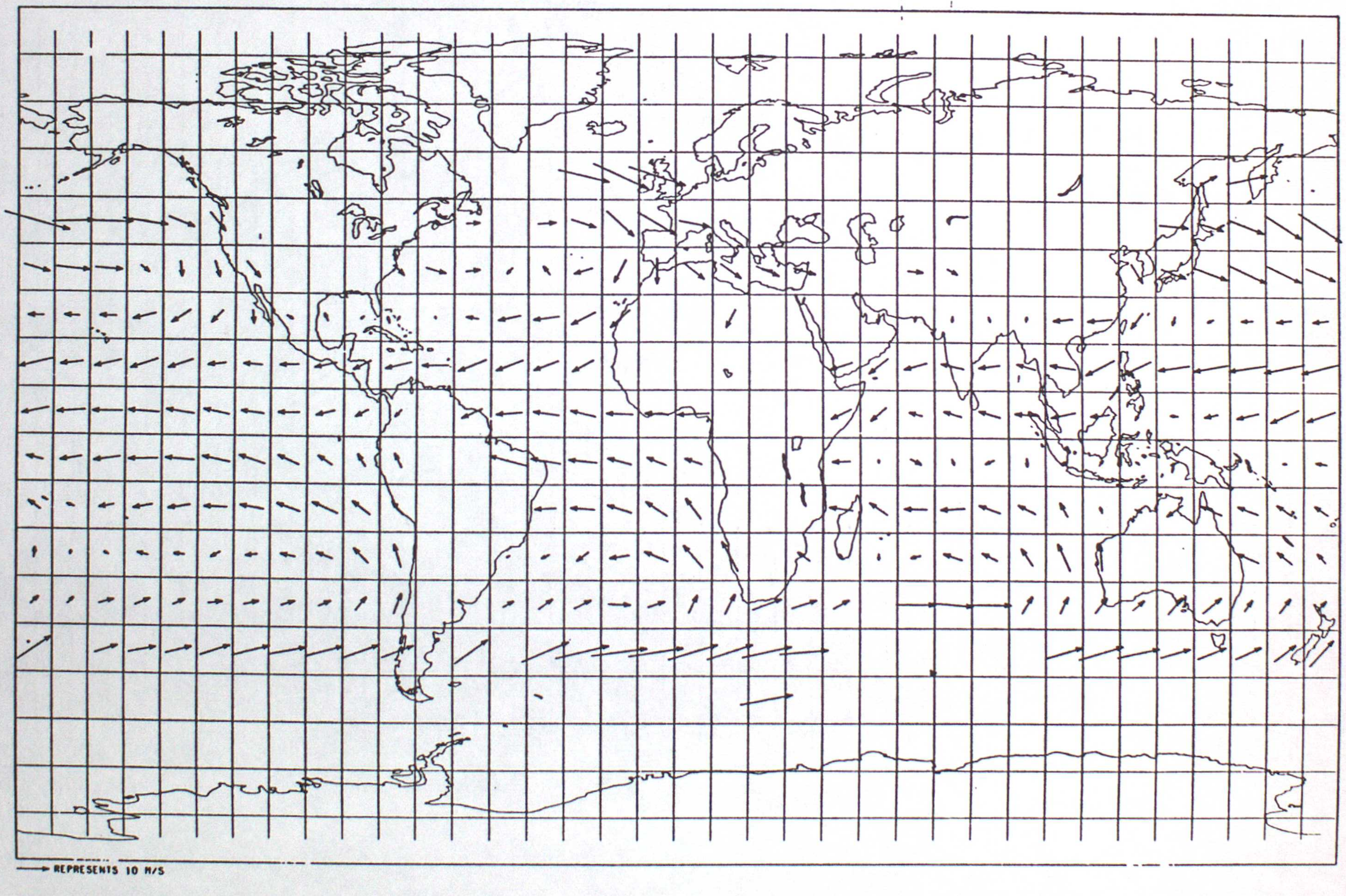
Period	:One calendar month.
Data monitored	:Reports from GOES, METEOSAT, GMS, INSAT.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer: 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa
	:Mean wind
	:Mean observation minus background vector wind differences
	:Mean observation minus background speed differences
	:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
DECEMBER 1993


1 2 0 0 0 0 1
1 1 8 6 8 4 0 0 0 1 4 11 12 6 1 0 0 4 10 36 23 6
7 0 9 13 19 12 1 0 0 0 5 9 2 4 13 30 34 2 1 7 5 4 0 0 1 1 0 0 0 6 0 18 28 29 22
28 3 23 28 27 11 4 1 6 13 12 15 7 14 31 35 6 0 0 1 0 0 0 4 3 5 3 5 2 3 19 19 26 35 40 38
29 2 17 21 19 11 10 15 10 15 19 23 13 19 17 5 0 0 0 3 16 13 13 15 21 12 10 8 19 25 33 44 42
7 0 15 23 27 22 27 22 15 9 1 0 1 4 3 5 7 5 1 0 0 0 9 18 16 13 11 11 8 3 3 7 4 5 5 7
6 1 18 32 42 53 57 51 27 10 1 0 1 13 49 61 39 7 0 0 7 9 11 8 7 8 2 2 1 1 2 2 3
6 1 8 13 29 49 64 72 63 27 3 0 14 52 99 97 27 0 0 3 13 14 13 12 53 43 7 1 6 20 13 9
17 0 6 7 7 11 25 33 41 36 14 0 2 4 17 45 49 28 5 0 3 4 3 5 4 3 65 81 6 0 15 23 27
6 1 10 9 11 10 14 18 20 24 14 0 8 3 9 9 8 11 19 15 8 9 3 0 1 1 1 8 46 36 37 32 5 24 35 19
0 0 7 8 9 10 9 10 9 10 4 1 2 6 7 8 10 14 11 4 0 4 23 37 43 27 26 13 0
0 0

SATOB VECTOR MEAN WINDS BETWEEN 701-1000 HPA
DECEMBER 1993
ALL OBSERVATIONS
ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

FIGURE 11


REPRESENTS 10 M/S

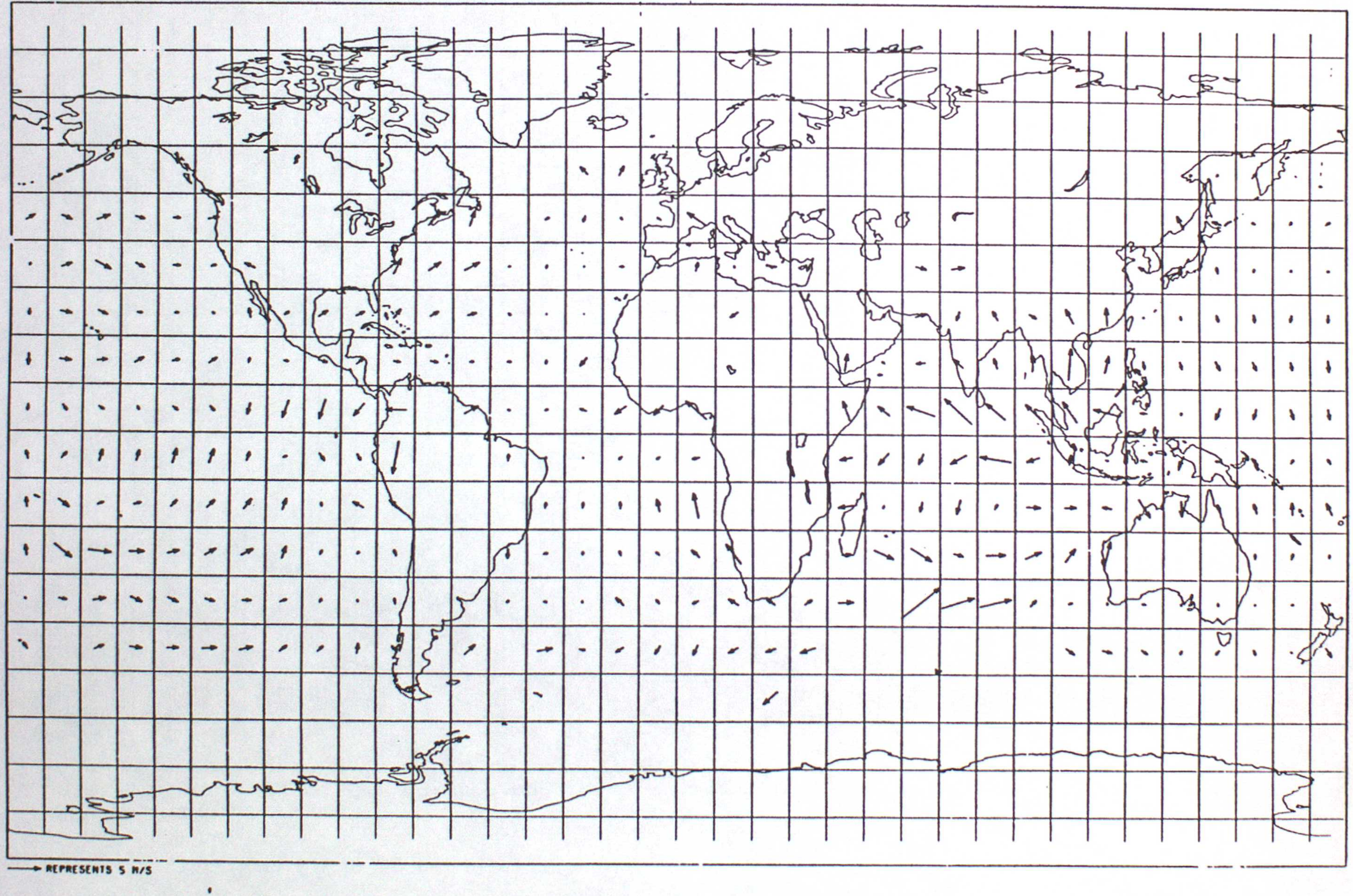
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701-1000 HPA

DECEMBER 1993

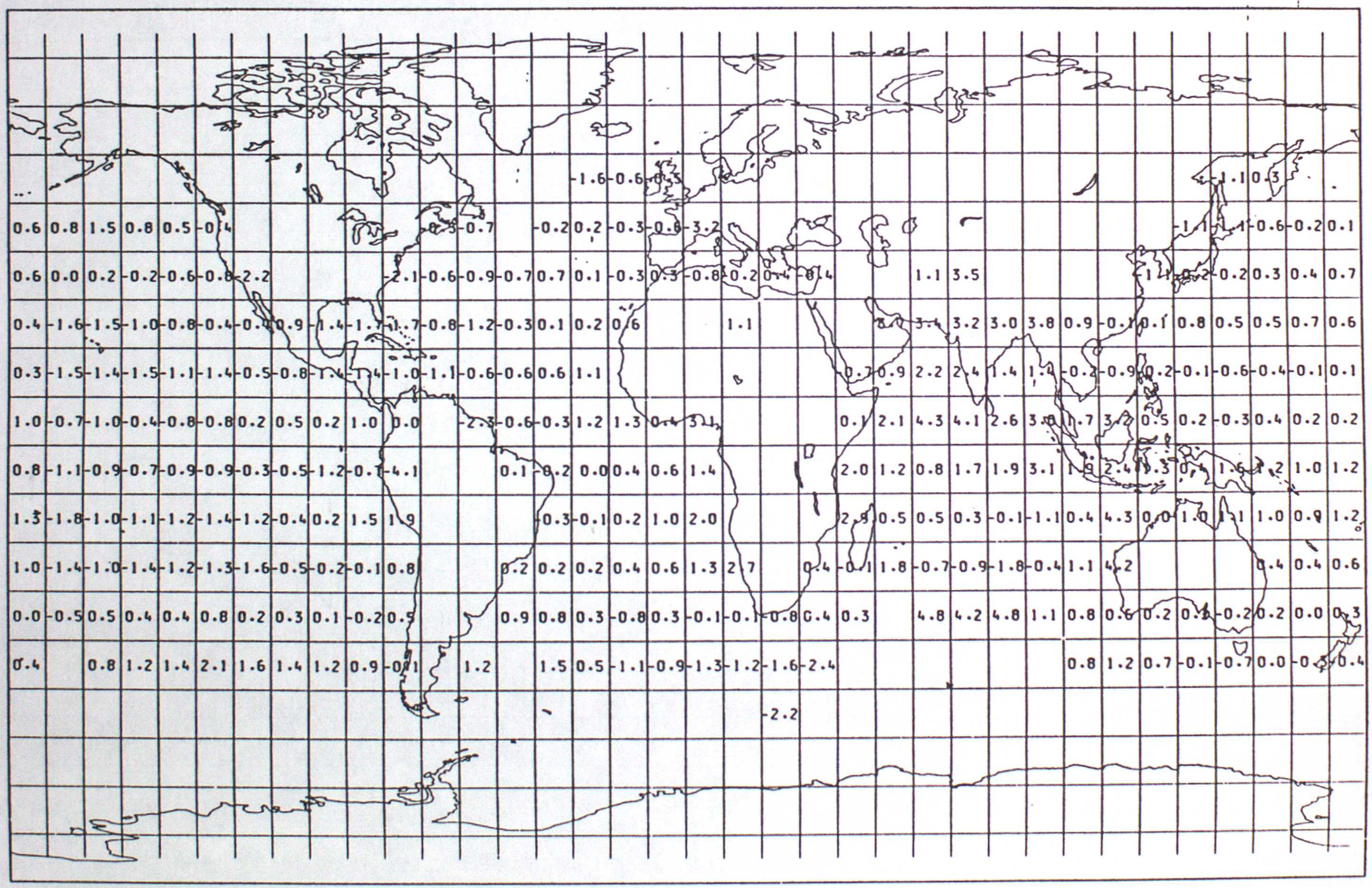
ALL OBSERVATIONS

ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

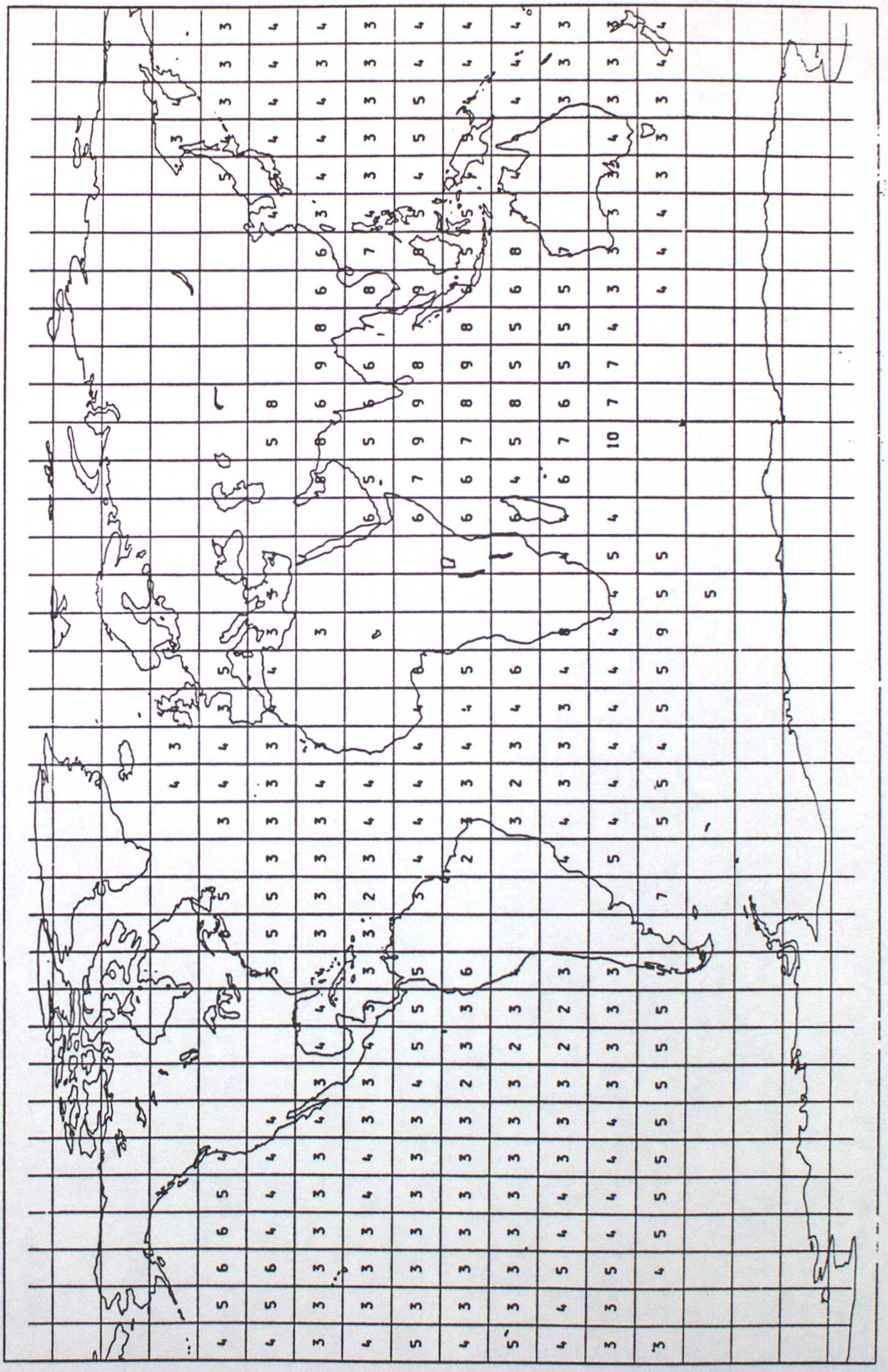
FIGURE 12


REPRESENTS 5 M/S

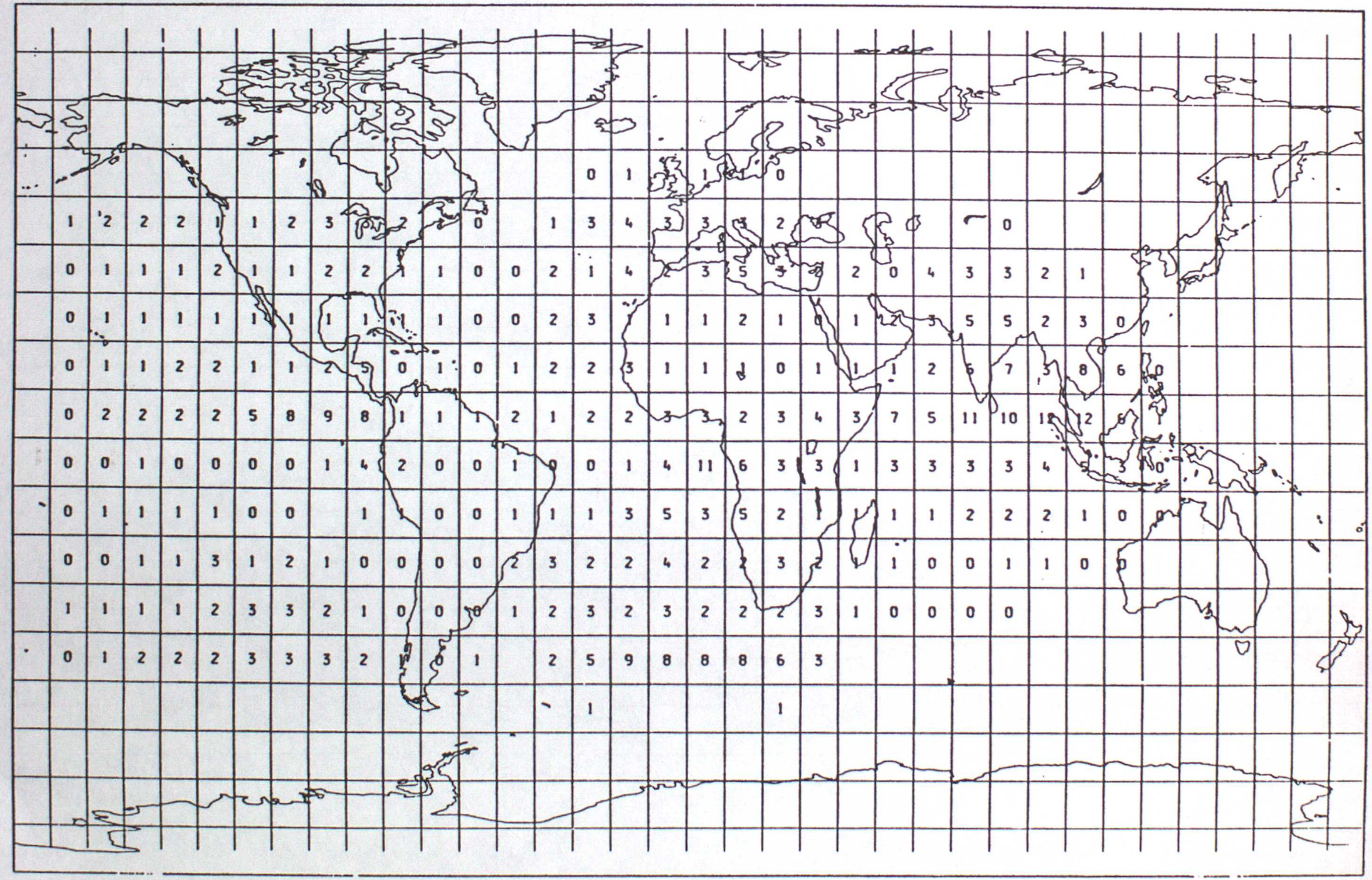
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
DECEMBER 1993
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT


-1.6 -0.6 -0.5 -1.1 0.3
0.6 0.8 1.5 0.8 0.5 -0.4 -0.5 -0.7 -0.2 0.2 -0.3 -0.6 -3.2 -1.1 -1.1 -0.6 -0.2 0.1
0.6 0.0 0.2 -0.2 -0.6 -0.8 -2.2 -2.1 -0.6 -0.9 -0.7 0.7 0.1 -0.3 0.3 -0.8 -0.2 0.4 -0.4 1.1 3.5 -1.1 -0.2 -0.2 0.3 0.4 0.7
0.4 -1.6 -1.5 -1.0 -0.8 -0.4 -0.4 0.9 -1.4 -1.7 -1.7 -0.8 -1.2 -0.3 0.1 0.2 0.6 1.1 3.0 3.4 3.2 3.0 3.8 0.9 -0.1 0.1 0.8 0.5 0.5 0.7 0.6
0.3 -1.5 -1.4 -1.5 -1.1 -1.4 -0.5 -0.8 -1.4 -1.4 -1.0 -1.1 -0.6 -0.6 0.6 1.1 0.7 0.9 2.2 2.4 1.4 1.4 -0.2 -0.9 0.2 -0.1 -0.6 -0.4 -0.1 0.1
1.0 -0.7 -1.0 -0.4 -0.8 -0.8 0.2 0.5 0.2 1.0 0.0 -2.3 -0.6 -0.3 1.2 1.3 0.4 3.1 0.1 2.1 4.3 4.1 2.6 3.0 1.7 3.2 0.5 0.2 -0.3 0.4 0.2 0.2
0.8 -1.1 -0.9 -0.7 -0.9 -0.9 -0.3 -0.5 -1.2 -0.1 -4.1 0.1 -0.2 0.0 0.4 0.6 1.4 2.0 1.2 0.8 1.7 1.9 3.1 1.9 2.4 1.3 0.4 1.6 1.2 1.0 1.2
1.3 -1.8 -1.0 -1.1 -1.2 -1.4 -1.2 -0.4 0.2 1.5 1.9 -0.3 -0.1 0.2 1.0 2.0 2.9 0.5 0.5 0.3 -0.1 -1.1 0.4 4.3 0.0 1.0 1.1 1.0 0.9 1.2
1.0 -1.4 -1.0 -1.4 -1.2 -1.3 -1.6 -0.5 -0.2 -0.1 0.8 0.2 0.2 0.2 0.4 0.6 1.3 2.7 0.4 -0.1 1.8 -0.7 -0.9 -1.8 -0.4 1.1 4.2 0.4 0.4 0.6
0.0 -0.5 0.5 0.4 0.4 0.8 0.2 0.3 0.1 -0.2 0.5 0.9 0.8 0.3 -0.8 0.3 -0.1 -0.1 -0.8 0.4 0.3 4.8 4.2 4.8 1.1 0.8 0.6 0.2 0.2 -0.2 0.2 0.0 0.3
0.4 0.8 1.2 1.4 2.1 1.6 1.4 1.2 0.9 -0.1 1.2 1.5 0.5 -1.1 -0.9 -1.3 -1.2 -1.6 -2.4 0.8 1.2 0.7 -0.1 -0.7 0.0 -0.5 0.4
-2.2

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
DECEMBER 1993
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT



AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
DECEMBER 1993


0 1 1 0
1 2 2 2 1 1 2 3 2 0 1 3 4 3 3 3 2 0
0 1 1 1 2 1 1 2 2 1 1 0 0 2 1 4 2 3 5 3 2 0 4 3 3 2 1
0 1 1 1 1 1 1 1 1 1 1 0 0 2 3 1 1 1 2 1 0 1 2 3 5 5 2 3 0
0 1 1 2 2 1 1 2 5 0 1 0 1 2 2 3 1 1 1 0 1 1 1 2 6 7 3 8 6 0
0 2 2 2 2 5 8 9 8 1 1 1 2 1 2 2 3 3 2 3 4 3 7 5 11 10 12 12 6
0 0 1 0 0 0 0 1 4 2 0 0 1 0 0 1 4 11 6 3 3 1 3 3 3 3 4 5 3 0
0 1 1 1 1 0 0 1 1 0 0 1 1 1 3 5 3 5 2 1 1 1 1 2 2 2 1 0 0
0 0 1 1 3 1 2 1 0 0 0 0 2 3 2 2 4 2 2 3 2 1 1 0 0 1 1 0 0
1 1 1 1 2 3 3 2 1 0 0 0 1 2 3 2 3 2 2 2 3 1 0 0 0 0
0 1 2 2 2 3 3 3 2 1 0 1 2 5 9 8 8 8 6 3
1 1

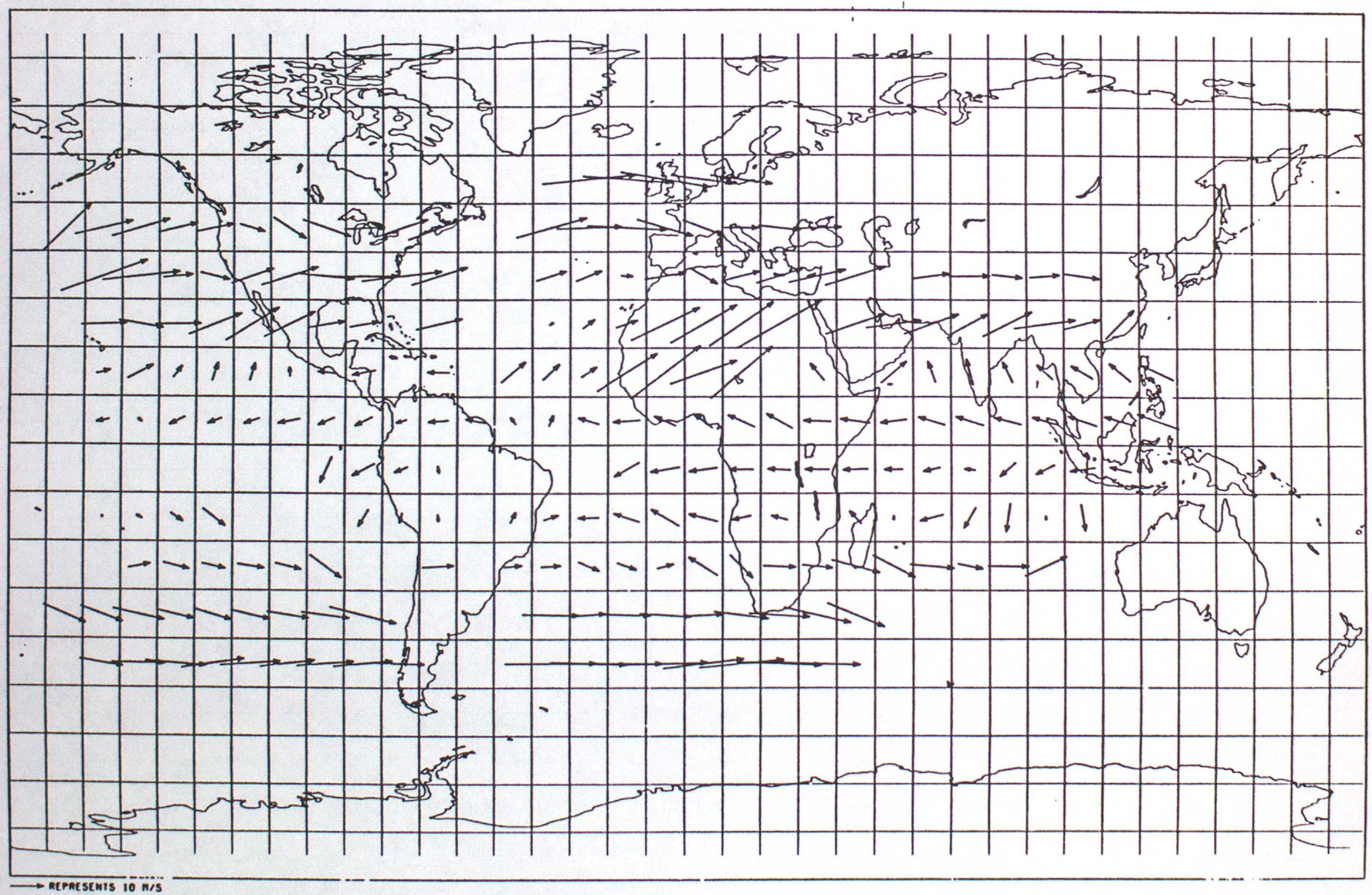
SATOB VECTOR MEAN WINDS BETWEEN 401-700 HPA

FIGURE 16

DECEMBER 1993

ALL OBSERVATIONS

ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT


REPRESENTS 10 M/S

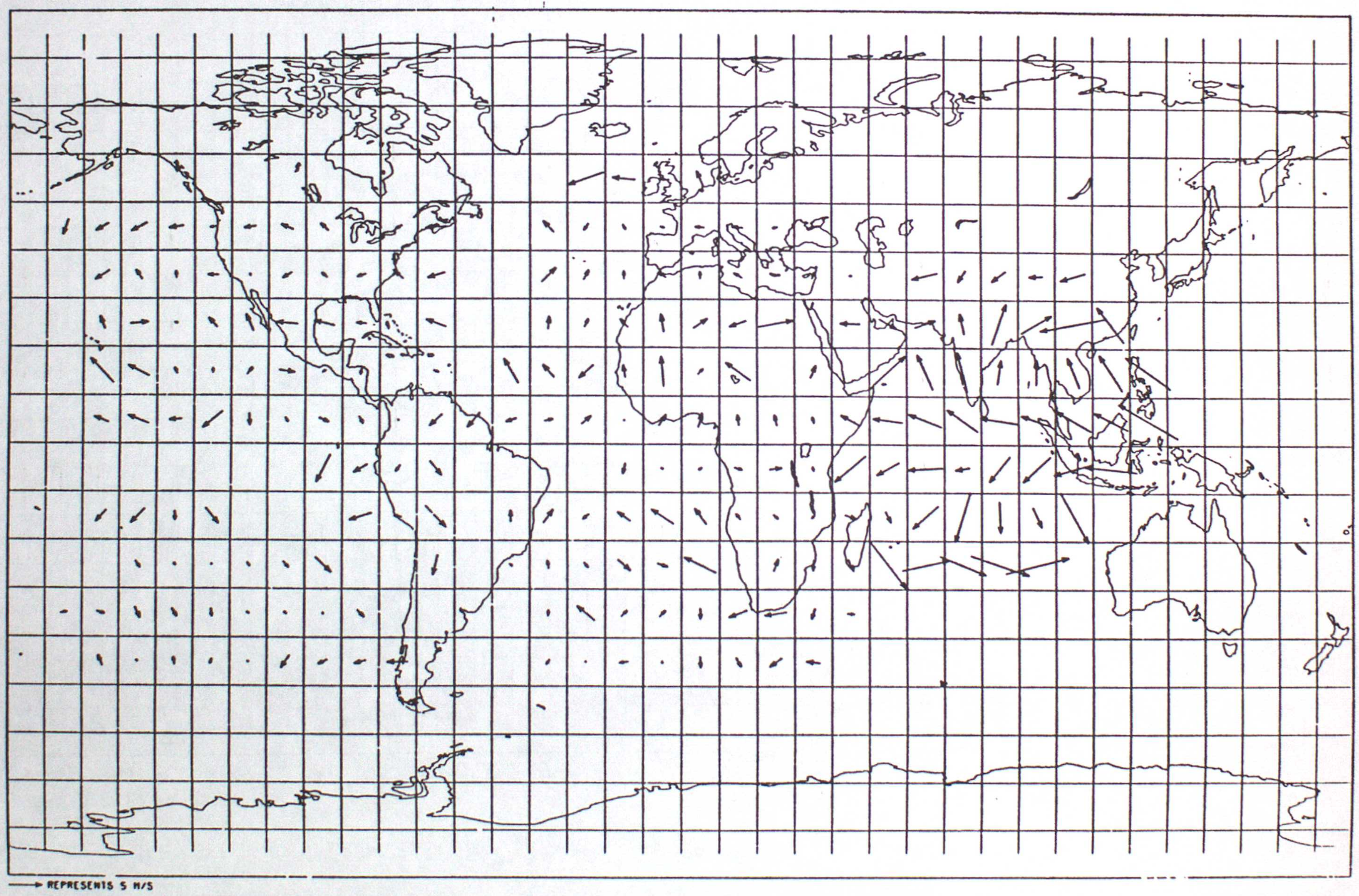
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA

DECEMBER 1993

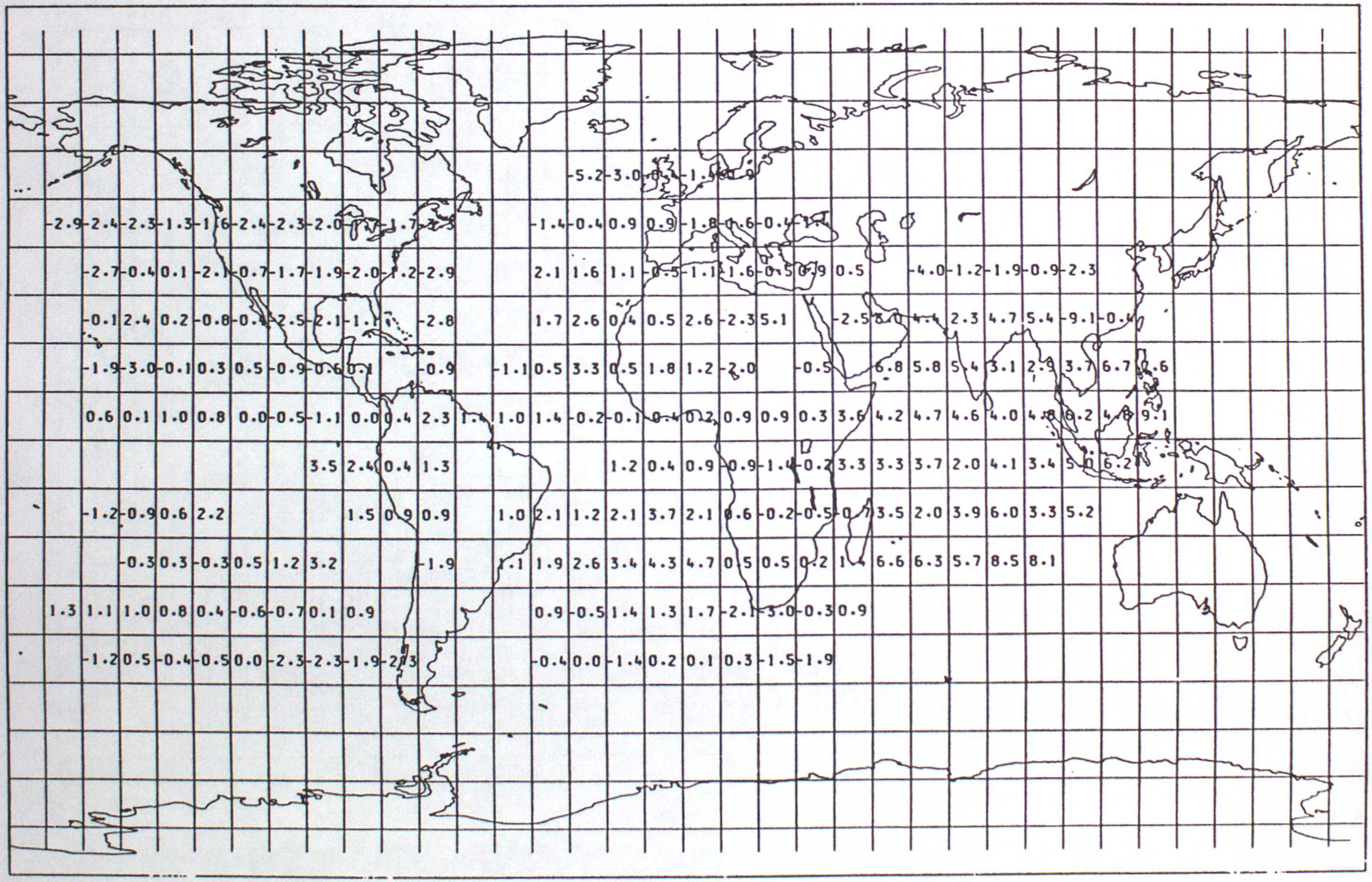
ALL OBSERVATIONS

ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

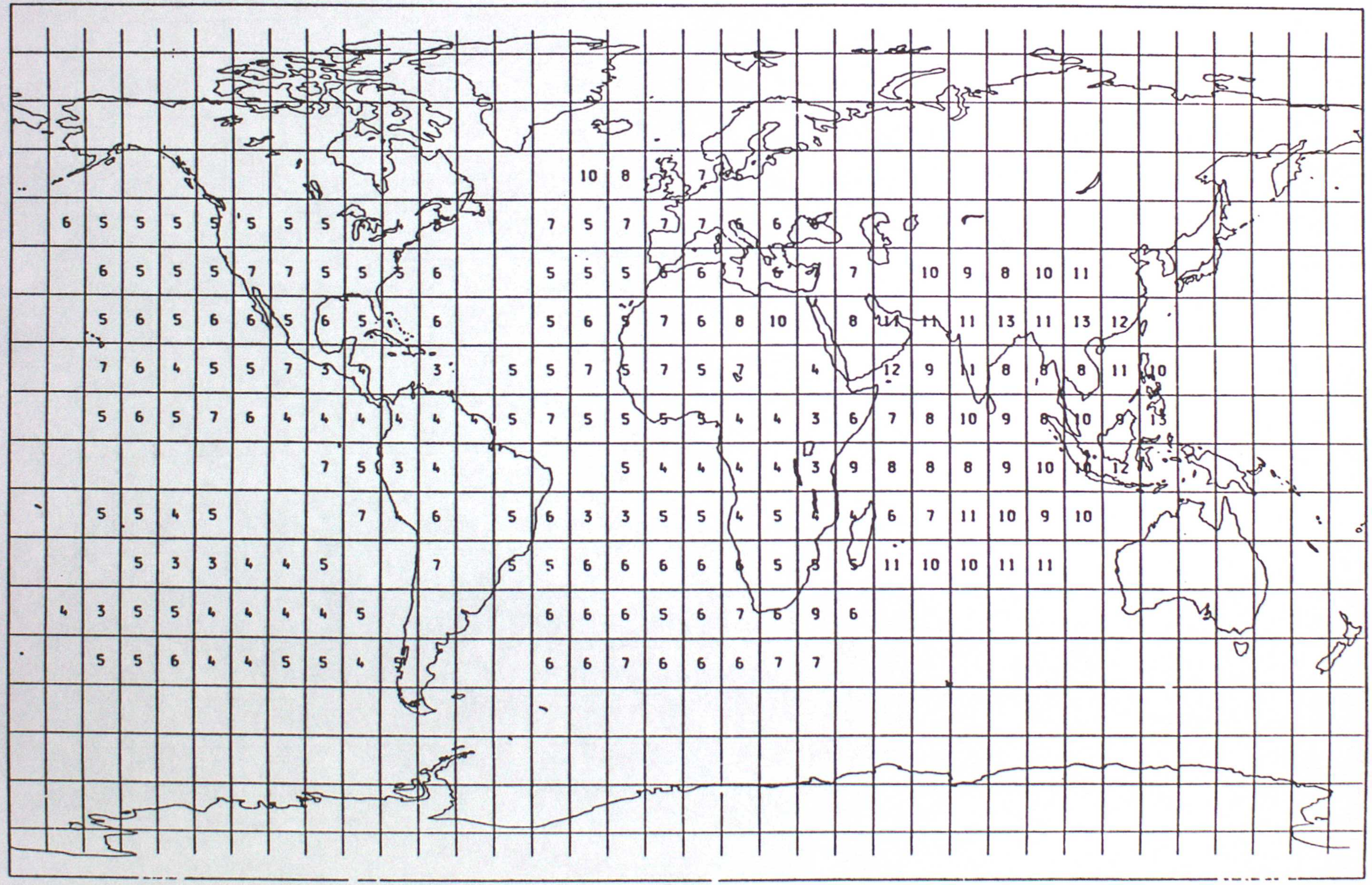
FIGURE 17


→ REPRESENTS 5 M/S

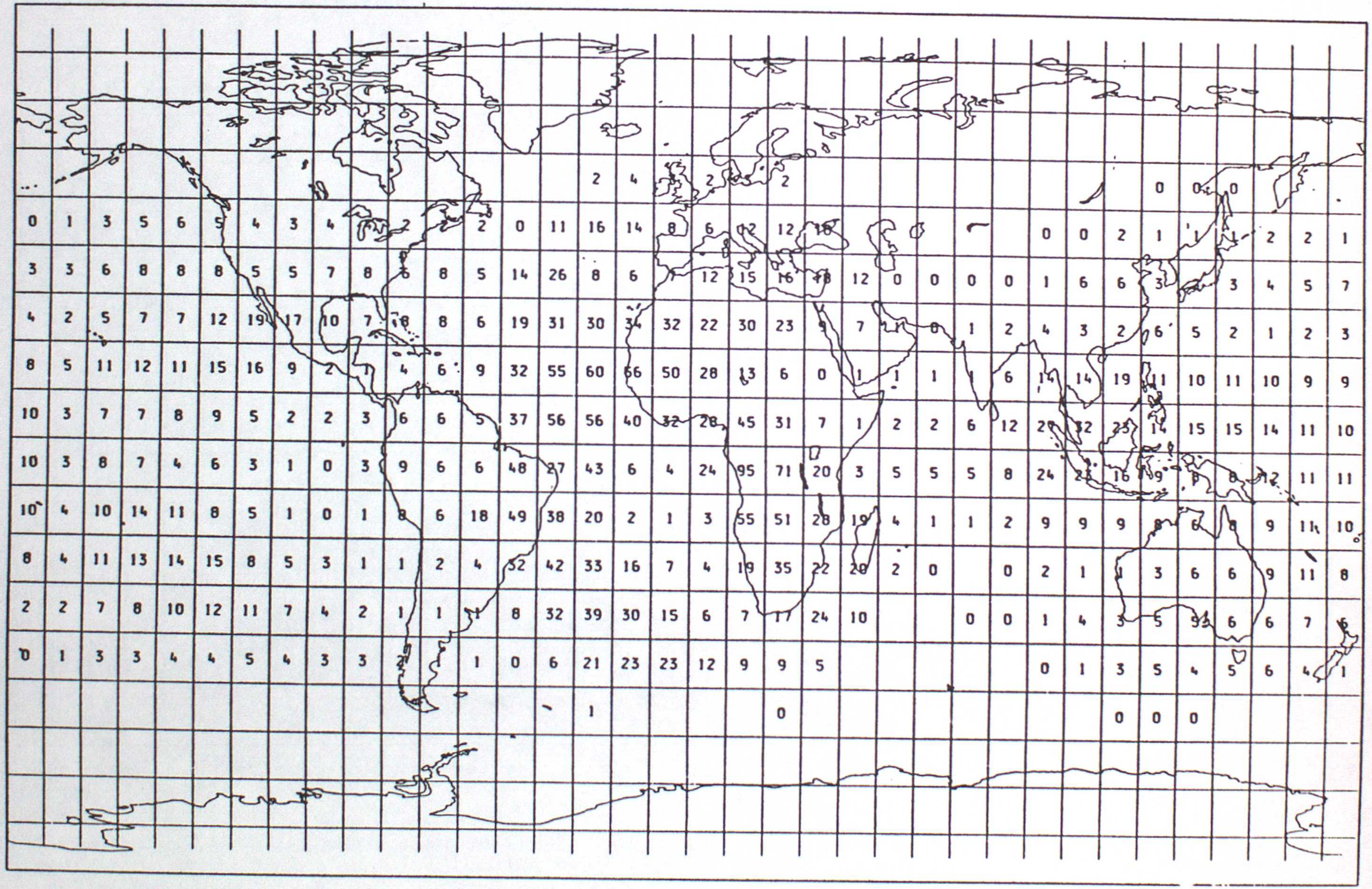
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
DECEMBER 1993
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT


-5.2 -3.0
-2.9 -2.4 -2.3 -1.3 -1.6 -2.4 -2.3 -2.0 -1.7 -1.4 -0.4 0.9 0.9 -1.8 -0.6 -0.4
-2.7 -0.4 0.1 -2.1 -0.7 -1.7 -1.9 -2.0 -1.2 -2.9 2.1 1.6 1.1 -0.5 -1.1 -1.6 -0.5 0.9 0.5 -4.0 -1.2 -1.9 -0.9 -2.3
-0.1 2.4 0.2 -0.8 -0.4 -2.5 -2.1 -1.1 -2.8 1.7 2.6 0.4 0.5 2.6 -2.3 5.1 -2.5 4.4 2.3 4.7 5.4 -9.1 -0.4
-1.9 -3.0 -0.1 0.3 0.5 -0.9 -0.6 0.1 -0.9 -1.1 0.5 3.3 0.5 1.8 1.2 -2.0 -0.5 6.8 5.8 5.4 3.1 2.9 3.7 6.7 2.6
0.6 0.1 1.0 0.8 0.0 -0.5 -1.1 0.0 0.4 2.3 1.0 1.4 -0.2 -0.1 0.4 0.2 0.9 0.9 0.3 3.6 4.2 4.7 4.6 4.0 4.8 6.2 4.8 9.1
3.5 2.4 0.4 1.3 1.2 0.4 0.9 -0.9 -1.4 -0.2 3.3 3.3 3.7 2.0 4.1 3.4 5.0 6.2
-1.2 -0.9 0.6 2.2 1.5 0.9 0.9 1.0 2.1 1.2 2.1 3.7 2.1 0.6 -0.2 -0.5 0.7 3.5 2.0 3.9 6.0 3.3 5.2
-0.3 0.3 -0.3 0.5 1.2 3.2 -1.9 1.1 1.9 2.6 3.4 4.3 4.7 0.5 0.5 0.2 1.4 6.6 6.3 5.7 8.5 8.1
1.3 1.1 1.0 0.8 0.4 -0.6 -0.7 0.1 0.9 0.9 -0.5 1.4 1.3 1.7 -2.1 -3.0 -0.3 0.9
-1.2 0.5 -0.4 -0.5 0.0 -2.3 -2.3 -1.9 2.3 -0.4 0.0 -1.4 0.2 0.1 0.3 -1.5 -1.9

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
DECEMBER 1993
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT


10 8 7
6 5 5 5 5 5 5 5 4 8 7 5 7 7 7 6 6 6
6 5 5 5 7 7 5 5 5 6 5 5 5 6 6 7 6 7 7 10 9 8 10 11
5 6 5 6 6 5 6 5 6 5 6 5 7 6 8 10 8 11 11 11 13 11 13 12
7 6 4 5 5 7 3 4 3 5 5 7 5 7 5 7 4 12 9 11 8 8 8 11 10
5 6 5 7 6 4 4 4 4 4 4 5 7 5 5 5 3 4 4 3 6 7 8 10 9 8 10 9 13
7 5 3 4 5 4 4 4 4 3 9 8 8 8 9 10 10 12
5 5 4 5 7 6 5 6 3 3 5 5 4 5 4 4 6 7 11 10 9 10
5 3 3 4 4 5 7 5 5 6 6 6 6 6 5 5 5 11 10 10 11 11
4 3 5 5 4 4 4 4 5 6 6 6 5 6 7 6 9 6
5 5 6 4 4 5 5 4 6 6 7 6 6 6 7 7

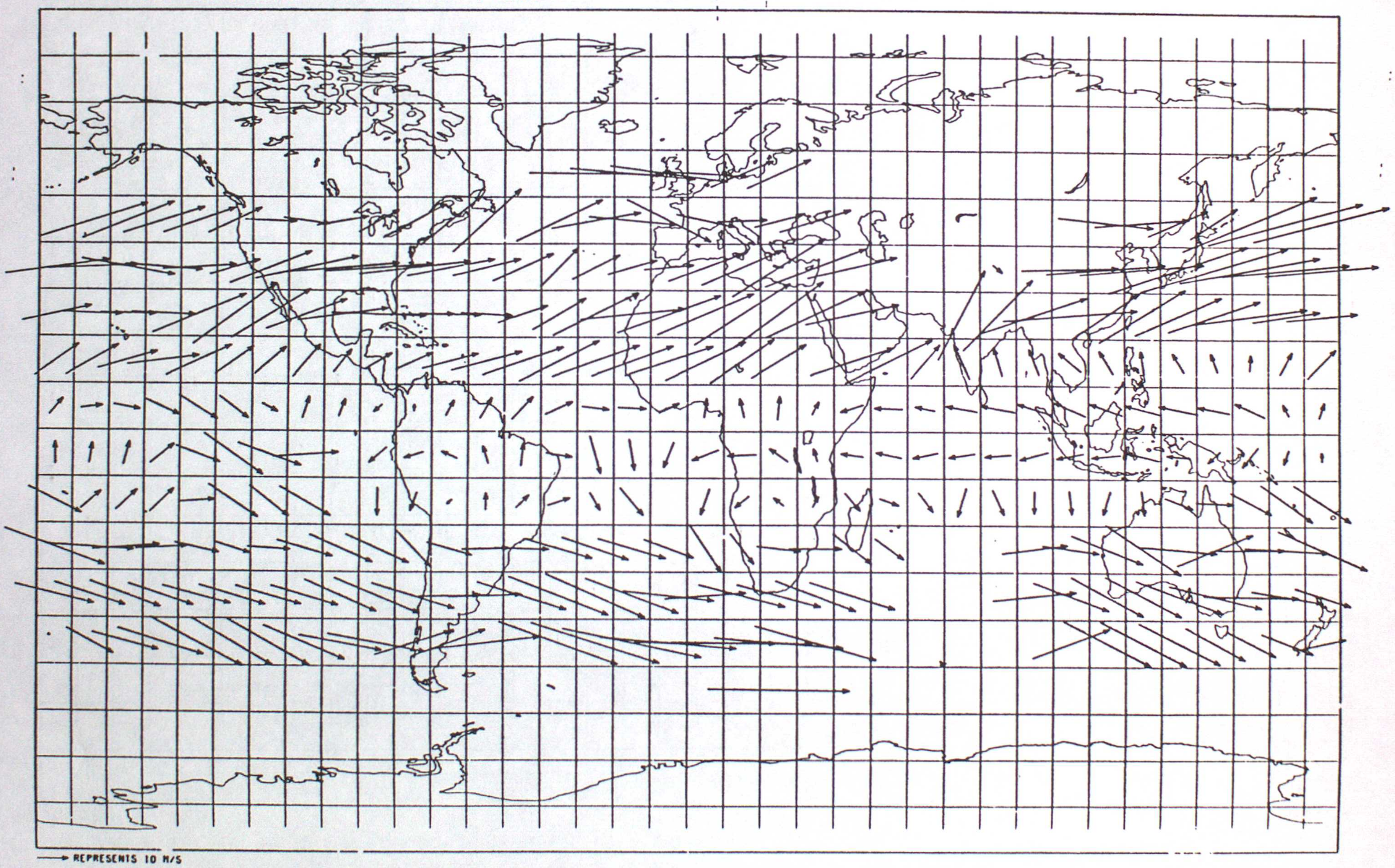
AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
DECEMBER 1993



															2	4		2		2										0	0	0			
0	1	3	5	6	5	4	3	4		2		2	0	11	16	14	8	6	12	12	18						0	0	2	1	1	1	2	2	1
3	3	6	8	8	8	5	5	7	8	6	8	5	14	26	8	6	7	12	15	16	18	12	0	0	0	0	1	6	6	3		3	4	5	7
4	2	5	7	7	12	19	17	10	7	8	8	6	19	31	30	34	32	22	30	23	9	7	1	0	1	2	4	3	2	6	5	2	1	2	3
8	5	11	12	11	15	16	9	2	1	4	6	9	32	55	60	66	50	28	13	6	0	1	1	1	1	6	14	14	19	11	10	11	10	9	9
10	3	7	7	8	9	5	2	2	3	6	6	5	37	56	56	40	32	28	45	31	7	1	2	2	6	12	29	32	23	14	15	15	14	11	10
10	3	8	7	4	6	3	1	0	3	9	6	6	48	27	43	6	4	24	95	71	20	3	5	5	5	8	24	23	16	9	8	8	12	11	11
10	4	10	14	11	8	5	1	0	1	8	6	18	49	38	20	2	1	3	55	51	28	19	4	1	1	2	9	9	9	8	6	8	9	14	10
8	4	11	13	14	15	8	5	3	1	1	2	4	32	42	33	16	7	4	19	35	22	20	2	0		0	2	1	1	3	6	6	9	11	8
2	2	7	8	10	12	11	7	4	2	1	1	1	8	32	39	30	15	6	7	17	24	10			0	0	1	4	3	5	9	6	6	7	6
0	1	3	3	4	4	5	4	3	3	2	1	1	0	6	21	23	23	12	9	9	5						0	1	3	5	4	5	6	4	1
															1					0									0	0	0				

SATOB VECTOR MEAN WINDS BETWEEN 101-400 HPA
DECEMBER 1993
ALL OBSERVATIONS
ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

FIGURE 21


→ REPRESENTS 10 M/S

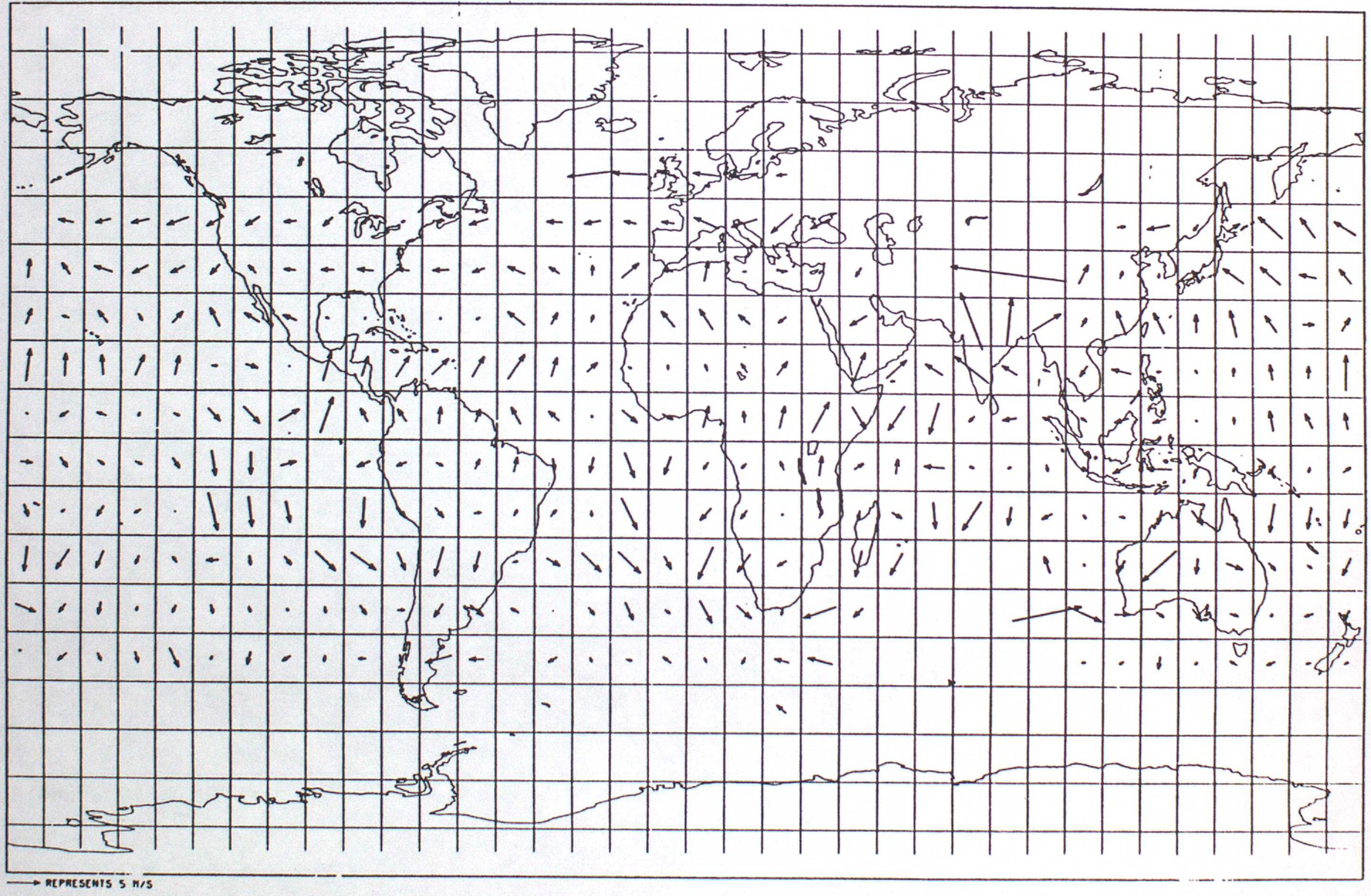
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101-400 HPA

DECEMBER 1993

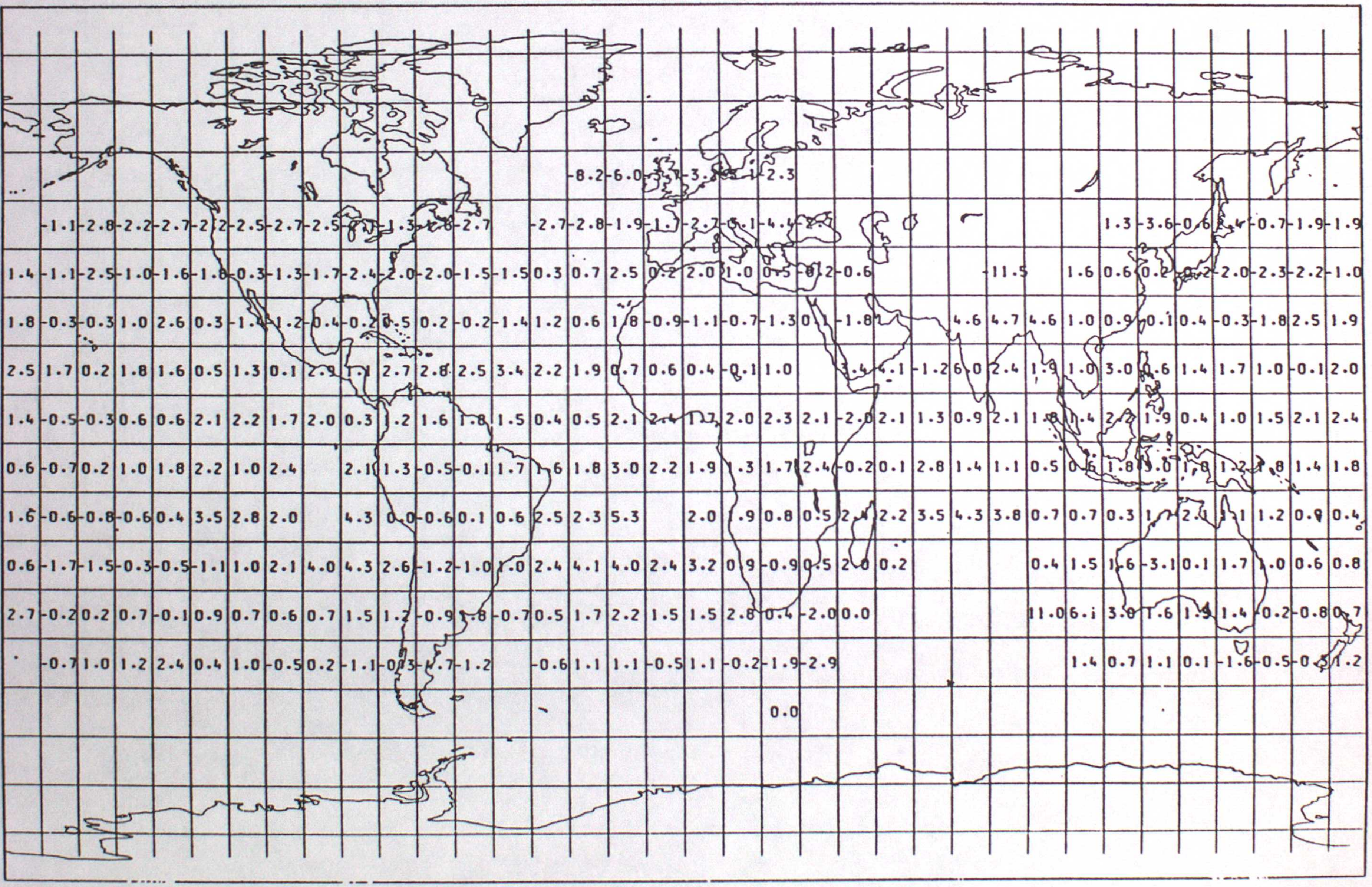
ALL OBSERVATIONS

ARROWS PLOTTED WHERE > 10 OBS ARE PRESENT

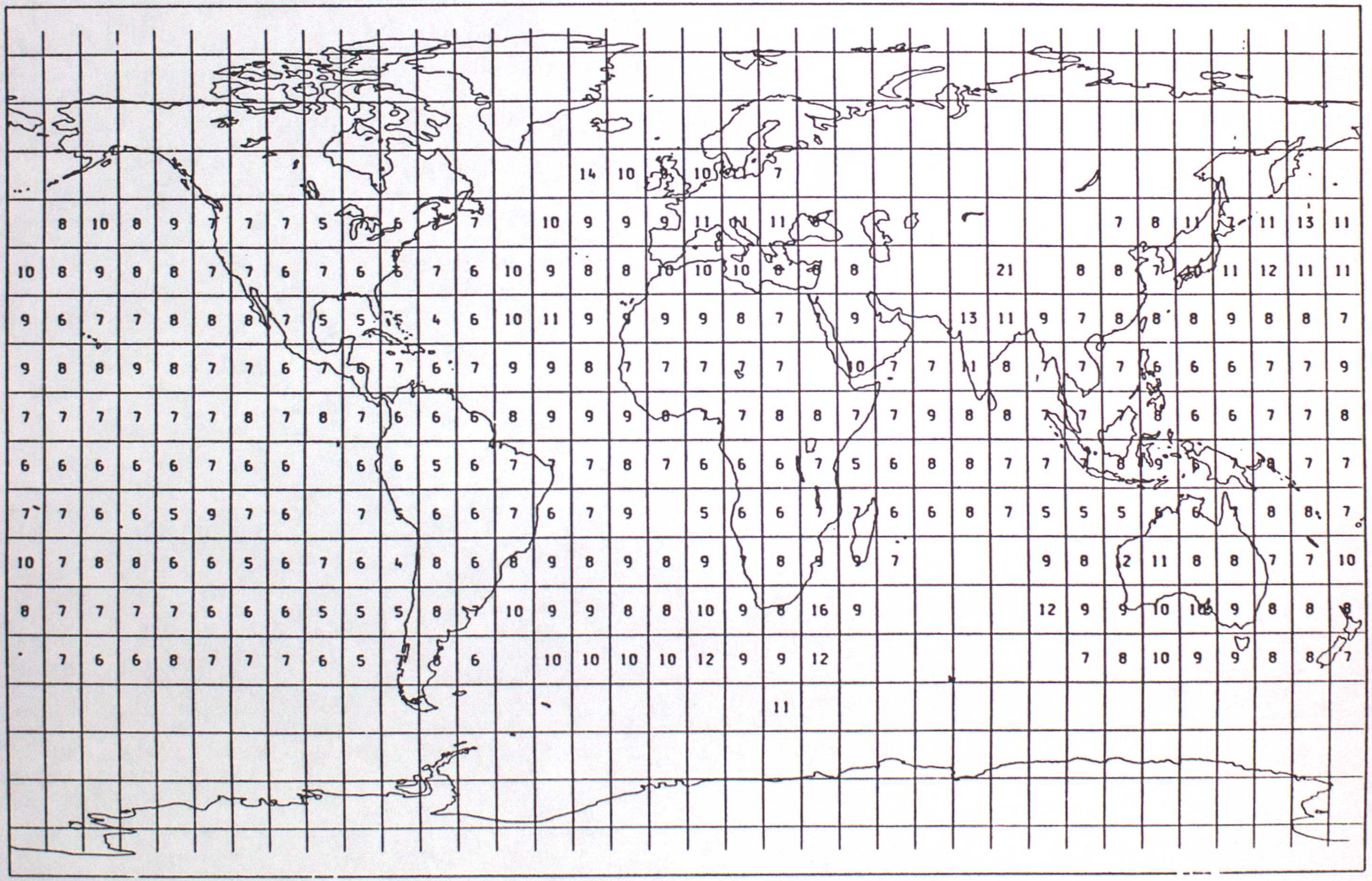
FIGURE 22


REPRESENTS 5 M/S

SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
DECEMBER 1993
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT


-8.2 -6.0 -2.3
-1.1 -2.8 -2.2 -2.7 -2.2 -2.5 -2.7 -2.5 -1.3 -2.7 -2.7 -2.8 -1.9 -1.7 -2.7 -1.4 1.3 -3.6 -0.6 -0.7 -1.9 -1.9
1.4 -1.1 -2.5 -1.0 -1.6 -1.8 -0.3 -1.3 -1.7 -2.4 -2.0 -2.0 -1.5 -1.5 0.3 0.7 2.5 0.2 2.0 1.0 -0.6 -11.5 1.6 0.6 -2.0 -2.3 -2.2 -1.0
1.8 -0.3 -0.3 1.0 2.6 0.3 -1.4 -1.2 -0.4 -0.2 0.5 0.2 -0.2 -1.4 1.2 0.6 1.8 -0.9 -1.1 -0.7 -1.3 -1.8 4.6 4.7 4.6 1.0 0.9 0.1 0.4 -0.3 -1.8 2.5 1.9
2.5 1.7 0.2 1.8 1.6 0.5 1.3 0.1 2.9 2.7 2.8 2.5 3.4 2.2 1.9 0.7 0.6 0.4 -0.1 1.0 -1.2 2.4 1.9 1.0 3.0 0.6 1.4 1.7 1.0 -0.1 2.0
1.4 -0.5 -0.3 0.6 0.6 2.1 2.2 1.7 2.0 0.3 1.2 1.6 1.8 1.5 0.4 0.5 2.1 2.0 2.3 2.1 -2.0 2.1 1.3 0.9 2.1 1.9 0.4 1.0 1.5 2.1 2.4
0.6 -0.7 0.2 1.0 1.8 2.2 1.0 2.4 2.1 1.3 -0.5 -0.1 1.7 1.6 1.8 3.0 2.2 1.9 1.3 1.7 2.4 -0.2 0.1 2.8 1.4 1.1 0.5 1.8 1.4 1.8
1.6 -0.6 -0.8 -0.6 0.4 3.5 2.8 2.0 4.3 0.0 -0.6 0.1 0.6 2.5 2.3 5.3 2.0 0.9 0.8 0.5 2.2 3.5 4.3 3.8 0.7 0.7 0.3 1.2 0.9 0.4
0.6 -1.7 -1.5 -0.3 -0.5 -1.1 1.0 2.1 4.0 4.3 2.6 -1.2 -1.0 1.0 2.4 4.1 4.0 2.4 3.2 0.9 -0.9 0.5 2.0 0.2 0.4 1.5 1.6 -3.1 0.1 1.7 1.0 0.6 0.8
2.7 -0.2 0.2 0.7 -0.1 0.9 0.7 0.6 0.7 1.5 1.2 -0.9 1.8 -0.7 0.5 1.7 2.2 1.5 1.5 2.8 0.4 -2.0 0.0 11.0 6.1 3.0 1.6 1.9 1.4 -0.2 -0.8 0.7
-0.7 1.0 1.2 2.4 0.4 1.0 -0.5 0.2 -1.1 -0.3 -4.7 -1.2 -0.6 1.1 1.1 -0.5 1.1 -0.2 -1.9 -2.9 1.4 0.7 1.1 0.1 -1.6 -0.5 -0.3 1.2
0.0

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
DECEMBER 1993
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 10 OBS ARE PRESENT



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

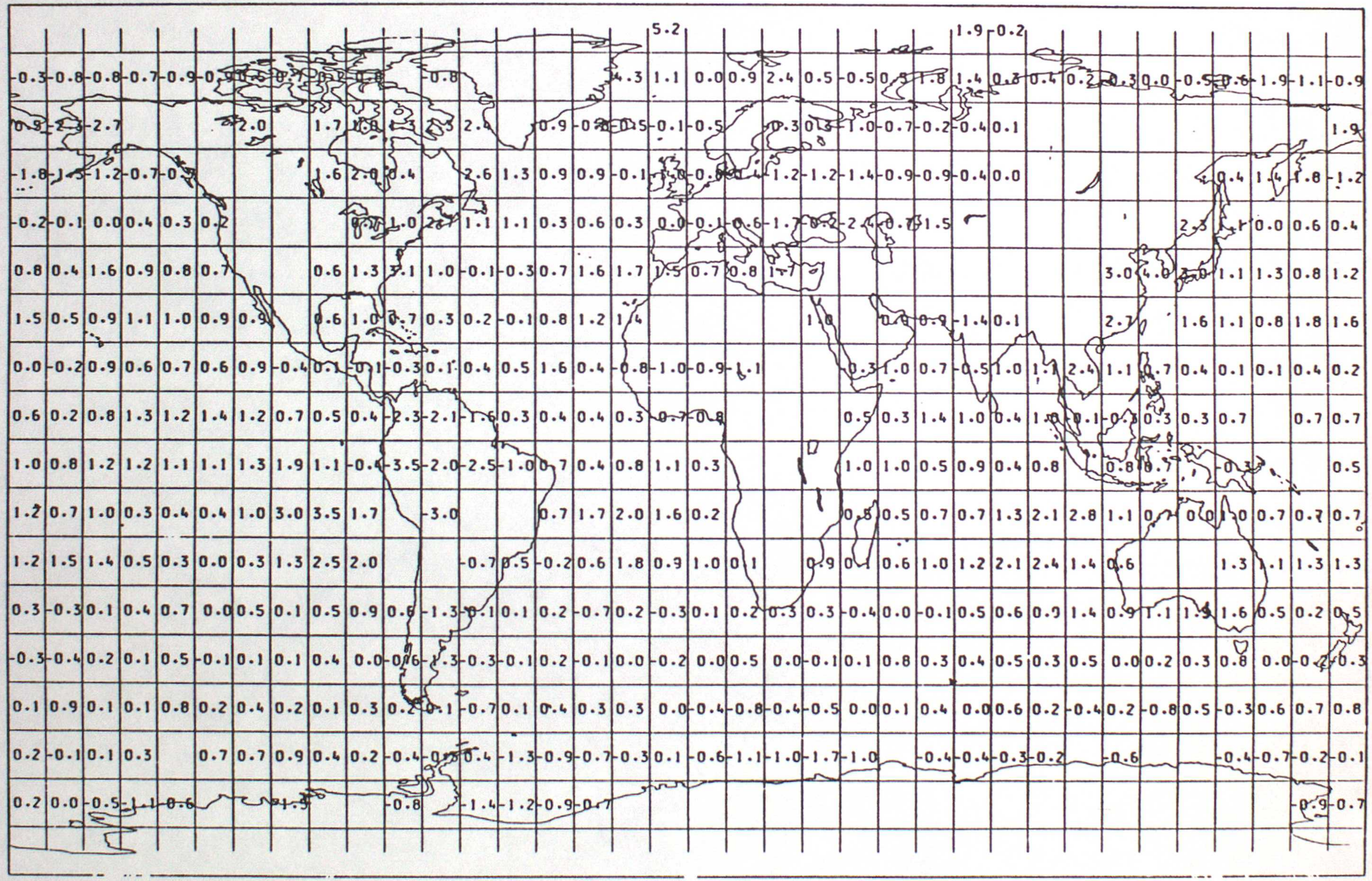
MONTH:December, 1993

Monitoring procedures

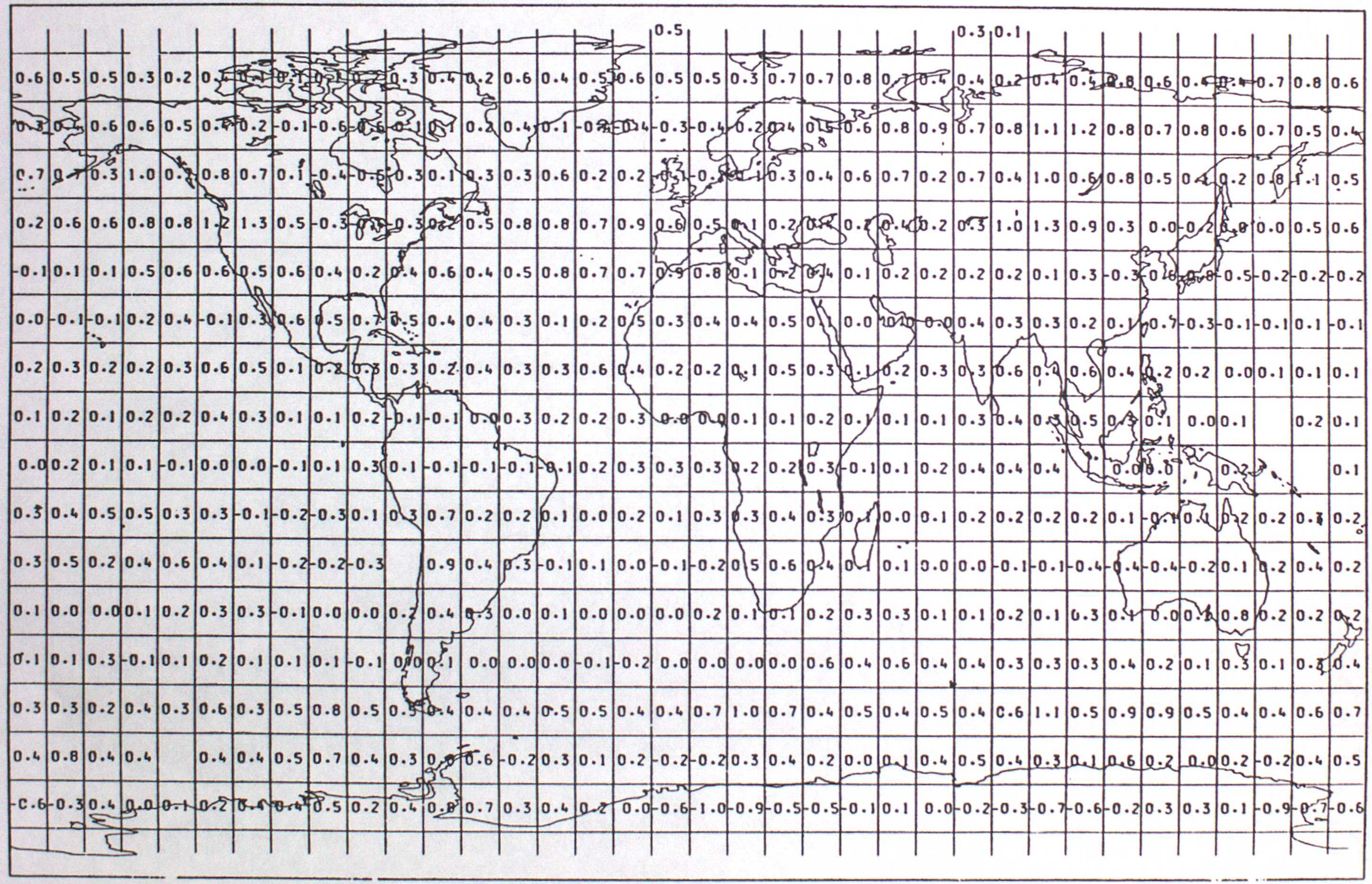
Period	:One calendar month.
Data monitored	:Reports from NOAA-11, NOAA-12 500 km.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:All SATEM soundings where number of observations > 30.
Data Extracted	:Layer: 850 - 1000 hPa 100 - 300 hPa 30 - 50 hPa
	:Mean observation minus background temperature differences

500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 850 TO 1000 HPA
DECEMBER 1993
NOAA-11. USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 25



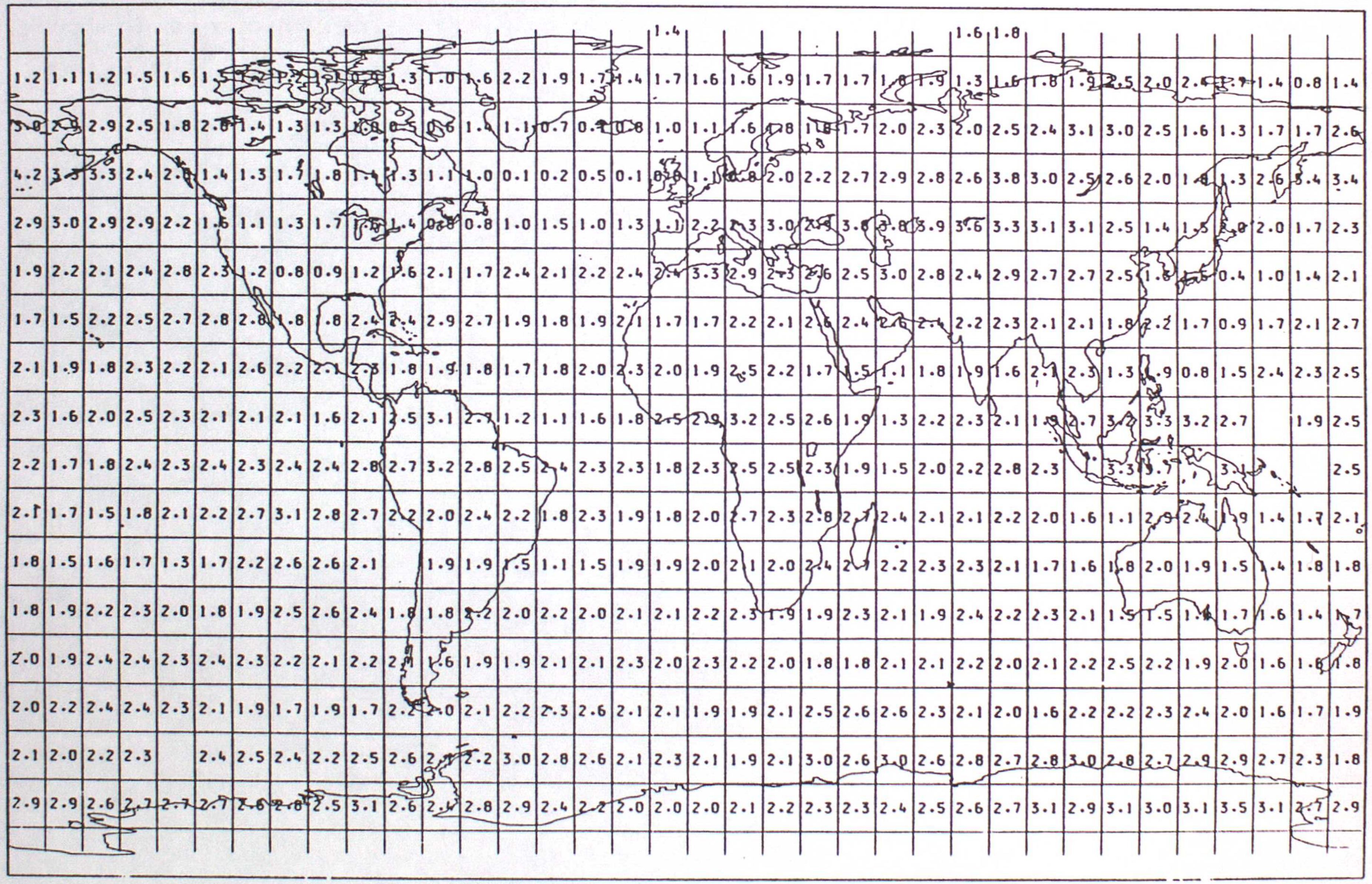
500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 100 TO 300 HPA
DECEMBER 1993
FIGURE 26
NOAA-11. USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT



																	0.5								0.3	0.1									
0.6	0.5	0.5	0.3	0.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.3	0.4	0.2	0.6	0.4	0.5	0.6	0.5	0.5	0.3	0.7	0.7	0.8	0.7	0.4	0.4	0.2	0.4	0.4	0.8	0.6	0.4	0.4	-0.7	0.8	0.6
0.3	0.4	0.6	0.6	0.5	0.4	0.2	-0.1	-0.6	-0.6	-0.1	0.1	0.2	0.4	0.1	-0.2	0.4	-0.3	-0.4	0.2	0.4	0.5	0.6	0.8	0.9	0.7	0.8	1.1	1.2	0.8	0.7	0.8	0.6	0.7	0.5	0.4
0.7	0.7	0.3	1.0	0.3	0.8	0.7	0.1	-0.4	-0.5	0.3	0.1	0.3	0.3	0.6	0.2	0.2	-0.1	[illegible]	-0.1	0.3	0.4	0.6	0.7	0.2	0.7	0.4	1.0	0.6	0.8	0.5	0.4	0.2	0.8	1.1	0.5
0.2	0.6	0.6	0.8	0.8	1.2	1.3	0.5	-0.3	[illegible]	-0.3	0.2	0.5	0.8	0.8	0.7	0.9	0.6	0.5	0.1	0.2	0.4	0.2	0.4	0.2	0.3	1.0	1.3	0.9	0.3	0.0	-0.2	0.8	0.0	0.5	0.6
-0.1	0.1	0.1	0.5	0.6	0.6	0.5	0.6	0.4	0.2	0.4	0.6	0.4	0.5	0.8	0.7	0.7	0.9	0.8	0.1	0.2	0.4	0.1	0.2	0.2	0.2	0.2	0.1	0.3	-0.3	-0.6	-0.8	-0.5	-0.2	-0.2	-0.2
0.0	-0.1	-0.1	0.2	0.4	-0.1	0.3	0.6	0.5	0.7	0.5	0.4	0.4	0.3	0.1	0.2	0.5	0.3	0.4	0.4	0.5	0.1	0.0	0.0	-0.0	0.4	0.3	0.3	0.2	0.1	-0.7	-0.3	-0.1	-0.1	0.1	-0.1
0.2	0.3	0.2	0.2	0.3	0.6	0.5	0.1	0.2	0.3	0.3	0.2	0.4	0.3	0.3	0.6	0.4	0.2	0.2	0.1	0.5	0.3	-0.1	0.2	0.3	0.3	0.6	0.4	0.6	0.4	0.2	0.2	0.0	0.1	0.1	0.1
0.1	0.2	0.1	0.2	0.2	0.4	0.3	0.1	0.1	0.2	-0.1	-0.1	0.0	0.3	0.2	0.2	0.3	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.4	0.3	0.5	0.3	0.1	0.0	0.1		0.2	0.1
0.0	0.2	0.1	0.1	-0.1	0.0	0.0	-0.1	0.1	0.3	0.1	-0.1	-0.1	-0.1	-0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.3	-0.1	0.1	0.2	0.4	0.4	0.4		0.0	0.0		0.2			0.1
0.3	0.4	0.5	0.5	0.3	0.3	-0.1	-0.2	-0.3	0.1	0.3	0.7	0.2	0.2	0.1	0.0	0.2	0.1	0.3	0.3	0.4	0.3	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.1	-0.1	0.1	0.2	0.2	0.3	0.2
0.3	0.5	0.2	0.4	0.6	0.4	0.1	-0.2	-0.2	-0.3		0.9	0.4	0.3	-0.1	0.1	0.0	-0.1	-0.2	0.5	0.6	0.4	0.1	0.1	0.0	0.0	-0.1	-0.1	-0.4	-0.4	-0.4	-0.2	0.1	0.2	0.4	0.2
0.1	0.0	0.0	0.1	0.2	0.3	0.3	-0.1	0.0	0.0	0.2	0.4	0.3	0.0	0.1	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.3	0.3	0.1	0.1	0.2	0.1	0.3	0.1	0.0	0.2	0.8	0.2	0.2	0.2
0.1	0.1	0.3	-0.1	0.1	0.2	0.1	0.1	0.1	-0.1	0.0	0.1	0.0	0.0	0.0	-0.1	-0.2	0.0	0.0	0.0	0.0	0.6	0.4	0.6	0.4	0.4	0.3	0.3	0.3	0.4	0.2	0.1	0.3	0.1	0.3	0.4
0.3	0.3	0.2	0.4	0.3	0.6	0.3	0.5	0.8	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.7	1.0	0.7	0.4	0.5	0.4	0.5	0.4	0.6	1.1	0.5	0.9	0.9	0.5	0.4	0.4	0.6	0.7
0.4	0.8	0.4	0.4		0.4	0.4	0.5	0.7	0.4	0.3	[illegible]	0.6	-0.2	0.3	0.1	0.2	-0.2	-0.2	0.3	0.4	0.2	0.0	0.1	0.4	0.5	0.4	0.3	0.1	0.6	0.2	0.0	0.2	-0.2	0.4	0.5
-0.6	-0.3	0.4	0.0	-0.1	-0.2	0.4	0.4	0.5	0.2	0.4	0.8	0.7	0.3	0.4	0.2	0.0	-0.6	-1.0	-0.9	-0.5	-0.5	-0.1	0.1	0.0	-0.2	-0.3	-0.7	-0.6	-0.2	0.3	0.3	0.1	-0.9	-0.7	-0.6

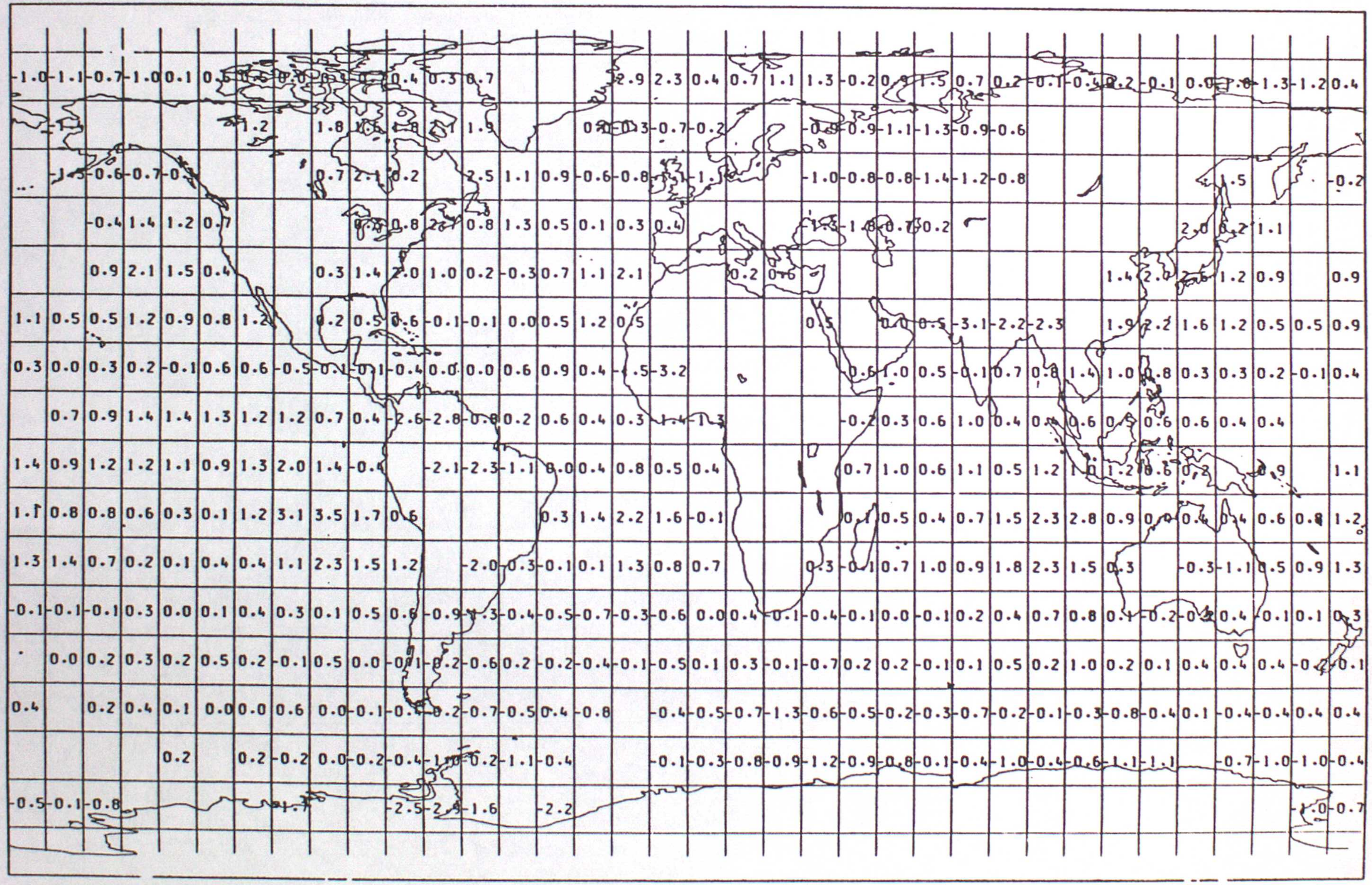
500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 30 TO 50 HPA
DECEMBER 1993
NOAA-11, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 27

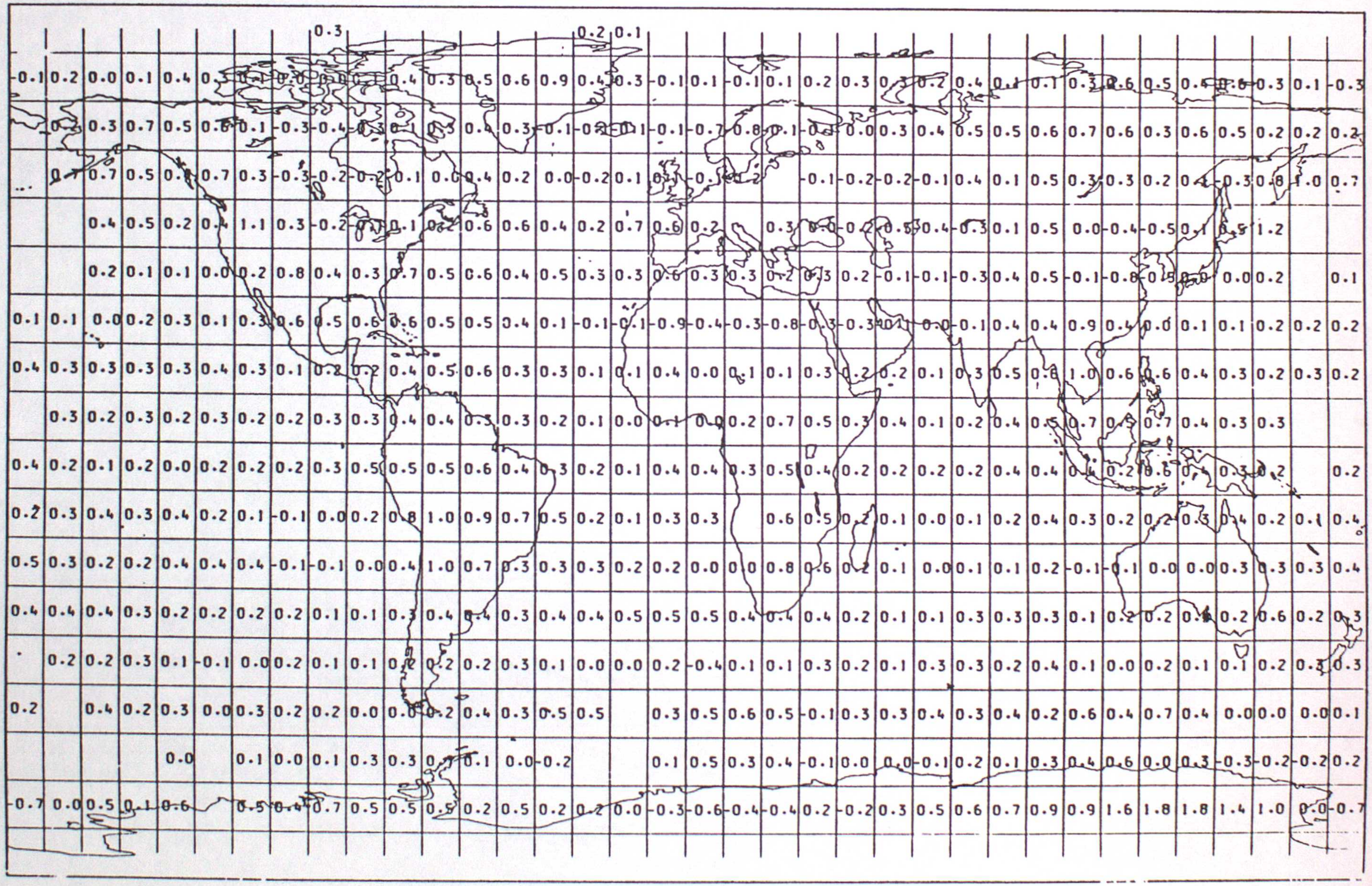

1.4
1.6 1.8
1.2 1.1 1.2 1.5 1.6 1.5 [illegible] [illegible] [illegible] [illegible] 1.3 1.0 1.6 2.2 1.9 1.7 1.4 1.7 1.6 1.6 1.9 1.7 1.7 1.8 1.9 1.3 1.6 1.8 1.9 2.5 2.0 2.4 1.7 1.4 0.8 1.4
3.0 2.9 2.9 2.5 1.8 2.6 1.4 1.3 1.3 0.8 0.5 0.6 1.4 1.1 0.7 [illegible] 0.8 1.0 1.1 1.6 1.8 1.8 1.7 2.0 2.3 2.0 2.5 2.4 3.1 3.0 2.5 1.6 1.3 1.7 1.7 2.6
4.2 3.3 3.3 2.4 2.6 1.4 1.3 1.7 1.8 1.4 1.3 1.1 1.0 0.1 0.2 0.5 0.1 0.6 1.1 0.8 2.0 2.2 2.7 2.9 2.8 2.6 3.8 3.0 2.5 2.6 2.0 1.8 1.3 2.6 3.4 3.4
2.9 3.0 2.9 2.9 2.2 1.6 1.1 1.3 1.7 1.6 1.4 0.8 0.8 1.0 1.5 1.0 1.3 1.1 2.2 2.3 3.0 2.9 3.6 3.8 3.9 3.6 3.3 3.1 3.1 2.5 1.4 1.5 2.0 2.0 1.7 2.3
1.9 2.2 2.1 2.4 2.8 2.3 1.2 0.8 0.9 1.2 1.6 2.1 1.7 2.4 2.1 2.2 2.4 2.4 3.3 2.9 2.3 2.6 2.5 3.0 2.8 2.4 2.9 2.7 2.7 2.5 1.8 1.5 0.4 1.0 1.4 2.1
1.7 1.5 2.2 2.5 2.7 2.8 2.8 1.8 1.8 2.4 2.4 2.9 2.7 1.9 1.8 1.9 2.1 1.7 1.7 2.2 2.1 2.6 2.4 2.6 2.4 2.2 2.3 2.1 2.1 1.8 2.2 1.7 0.9 1.7 2.1 2.7
2.1 1.9 1.8 2.3 2.2 2.1 2.6 2.2 2.1 2.3 1.8 1.9 1.8 1.7 1.8 2.0 2.3 2.0 1.9 2.5 2.2 1.7 1.5 1.1 1.8 1.9 1.6 2.1 2.3 1.3 1.9 0.8 1.5 2.4 2.3 2.5
2.3 1.6 2.0 2.5 2.3 2.1 2.1 2.1 1.6 2.1 2.5 3.1 2.7 1.2 1.1 1.6 1.8 2.5 2.9 3.2 2.5 2.6 1.9 1.3 2.2 2.3 2.1 1.9 2.7 3.2 3.3 3.2 2.7 1.9 2.5
2.2 1.7 1.8 2.4 2.3 2.4 2.3 2.4 2.4 2.8 2.7 3.2 2.8 2.5 2.4 2.3 2.3 1.8 2.3 2.5 2.5 2.3 1.9 1.5 2.0 2.2 2.8 2.3 3.3 3.7 3.1 2.5
2.1 1.7 1.5 1.8 2.1 2.2 2.7 3.1 2.8 2.7 2.2 2.0 2.4 2.2 1.8 2.3 1.9 1.8 2.0 2.7 2.3 2.8 2.7 2.4 2.1 2.1 2.2 2.0 1.6 1.1 2.9 2.4 1.9 1.4 1.7 2.1
1.8 1.5 1.6 1.7 1.3 1.7 2.2 2.6 2.6 2.1 1.9 1.9 1.5 1.1 1.5 1.9 1.9 2.0 2.1 2.0 2.4 2.7 2.2 2.3 2.3 2.1 1.7 1.6 1.8 2.0 1.9 1.5 1.4 1.8 1.8
1.8 1.9 2.2 2.3 2.0 1.8 1.9 2.5 2.6 2.4 1.8 1.8 2.2 2.0 2.2 2.0 2.1 2.1 2.2 2.3 1.9 1.9 2.3 2.1 1.9 2.4 2.2 2.3 2.1 1.5 1.5 1.4 1.7 1.6 1.4 1.7
2.0 1.9 2.4 2.4 2.3 2.4 2.3 2.2 2.1 2.2 [illegible] 1.6 1.9 1.9 2.1 2.1 2.3 2.0 2.3 2.2 2.0 1.8 1.8 2.1 2.1 2.2 2.0 2.1 2.2 2.5 2.2 1.9 2.0 1.6 1.6 1.8
2.0 2.2 2.4 2.4 2.3 2.1 1.9 1.7 1.9 1.7 2.2 2.0 2.1 2.2 2.3 2.6 2.1 2.1 1.9 1.9 2.1 2.5 2.6 2.6 2.3 2.1 2.0 1.6 2.2 2.2 2.3 2.4 2.0 1.6 1.7 1.9
2.1 2.0 2.2 2.3 2.4 2.5 2.4 2.2 2.5 2.6 [illegible] 2.2 3.0 2.8 2.6 2.1 2.3 2.1 1.9 2.1 3.0 2.6 3.0 2.6 2.8 2.7 2.8 3.0 2.8 2.7 2.9 2.9 2.7 2.3 1.8
2.9 2.9 2.6 2.7 2.7 2.7 2.6 2.8 2.5 3.1 2.6 2.4 2.8 2.9 2.4 2.2 2.0 2.0 2.0 2.1 2.2 2.3 2.3 2.4 2.5 2.6 2.7 3.1 2.9 3.1 3.0 3.1 3.5 3.1 2.7 2.9

500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 850 TO 1000 HPA
DECEMBER 1993
NOAA-12. USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 28



500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 100 TO 300 HPA
DECEMBER 1993
FIGURE 29
NOAA-12. USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


0.3 0.2 0.1
-0.1 0.2 0.0 0.1 0.4 0.3 0.4 0.3 0.5 0.6 0.9 0.4 0.3 -0.1 0.1 -0.1 0.1 0.2 0.3 0.3 0.2 0.4 0.1 0.1 0.3 0.6 0.5 0.4 0.6 0.3 0.1 -0.3
0.3 0.7 0.5 0.6 0.1 -0.3 -0.4 0.3 0.3 0.4 0.3 -0.1 -0.1 -0.1 -0.7 0.8 -0.1 0.0 0.3 0.4 0.5 0.5 0.6 0.7 0.6 0.3 0.6 0.5 0.2 0.2 0.2
0.7 0.7 0.5 0.7 0.3 -0.3 -0.2 -0.2 0.1 0.0 0.4 0.2 0.0 -0.2 0.1 -0.1 -0.1 -0.2 -0.2 -0.1 0.4 0.1 0.5 0.3 0.3 0.2 0.4 -0.3 0.8 1.0 0.7
0.4 0.5 0.2 0.4 1.1 0.3 -0.2 0.1 0.2 0.6 0.6 0.4 0.2 0.7 0.6 0.2 0.3 0.0 -0.2 -0.5 -0.4 -0.3 0.1 0.5 0.0 -0.4 -0.5 0.1 0.5 1.2
0.2 0.1 0.1 0.0 0.2 0.8 0.4 0.3 0.7 0.5 0.6 0.4 0.5 0.3 0.3 0.6 0.3 0.3 0.2 0.3 0.2 -0.1 -0.1 -0.3 0.4 0.5 -0.1 -0.8 -0.5 0.0 0.0 0.2 0.1
0.1 0.1 0.0 0.2 0.3 0.1 0.3 0.6 0.5 0.6 0.6 0.5 0.5 0.4 0.1 -0.1 -0.1 -0.9 -0.4 -0.3 -0.8 -0.3 -0.3 0.1 0.0 -0.1 0.4 0.4 0.9 0.4 0.0 0.1 0.1 0.2 0.2 0.2
0.4 0.3 0.3 0.3 0.3 0.4 0.3 0.1 0.2 0.2 0.4 0.5 0.6 0.3 0.3 0.1 0.1 0.4 0.0 0.1 0.1 0.3 0.2 0.2 0.1 0.3 0.5 0.6 1.0 0.6 0.6 0.4 0.3 0.2 0.3 0.2
0.3 0.2 0.3 0.2 0.3 0.2 0.2 0.3 0.3 0.4 0.4 0.3 0.3 0.2 0.1 0.0 0.1 0.0 0.2 0.7 0.5 0.3 0.4 0.1 0.2 0.4 0.5 0.7 0.5 0.7 0.4 0.3 0.3
0.4 0.2 0.1 0.2 0.0 0.2 0.2 0.2 0.3 0.5 0.5 0.5 0.6 0.4 0.3 0.2 0.1 0.4 0.4 0.3 0.5 0.4 0.2 0.2 0.2 0.2 0.4 0.4 0.4 0.2 0.6 0.4 0.3 0.2 0.2
0.2 0.3 0.4 0.3 0.4 0.2 0.1 -0.1 0.0 0.2 0.8 1.0 0.9 0.7 0.5 0.2 0.1 0.3 0.3 0.6 0.5 0.2 0.1 0.0 0.1 0.2 0.4 0.3 0.2 0.2 0.3 0.4 0.2 0.1 0.4
0.5 0.3 0.2 0.2 0.4 0.4 0.4 -0.1 -0.1 0.0 0.4 1.0 0.7 0.3 0.3 0.3 0.2 0.2 0.0 0.0 0.8 0.6 0.2 0.1 0.0 0.1 0.1 0.2 -0.1 -0.1 0.0 0.0 0.3 0.3 0.3 0.4
0.4 0.4 0.4 0.3 0.2 0.2 0.2 0.2 0.1 0.1 0.3 0.4 0.4 0.3 0.4 0.4 0.5 0.5 0.5 0.4 0.4 0.4 0.2 0.1 0.1 0.3 0.3 0.3 0.1 0.2 0.2 0.4 0.2 0.6 0.2 0.3
0.2 0.2 0.3 0.1 -0.1 0.0 0.2 0.1 0.1 0.2 0.2 0.2 0.3 0.1 0.0 0.0 0.2 -0.4 0.1 0.1 0.3 0.2 0.1 0.3 0.3 0.2 0.4 0.1 0.0 0.2 0.1 0.1 0.2 0.3 0.3
0.2 0.4 0.2 0.3 0.0 0.3 0.2 0.2 0.0 0.0 0.2 0.4 0.3 0.5 0.5 0.3 0.5 0.6 0.5 -0.1 0.3 0.3 0.4 0.3 0.4 0.2 0.6 0.4 0.7 0.4 0.0 0.0 0.0 0.1
0.0 0.1 0.0 0.1 0.3 0.3 0.1 0.1 0.0 -0.2 0.1 0.5 0.3 0.4 -0.1 0.0 0.0 -0.1 0.2 0.1 0.3 0.4 0.6 0.0 0.3 -0.3 -0.2 -0.2 0.2
-0.7 0.0 0.5 0.1 0.6 0.5 0.4 0.7 0.5 0.5 0.5 0.2 0.5 0.2 0.2 0.0 -0.3 -0.6 -0.4 -0.4 0.2 -0.2 0.3 0.5 0.6 0.7 0.9 0.9 1.6 1.8 1.8 1.4 1.0 0.0 -0.7

500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 30 TO 50 HPA
DECEMBER 1993
NOAA-12. USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

FIGURE 30

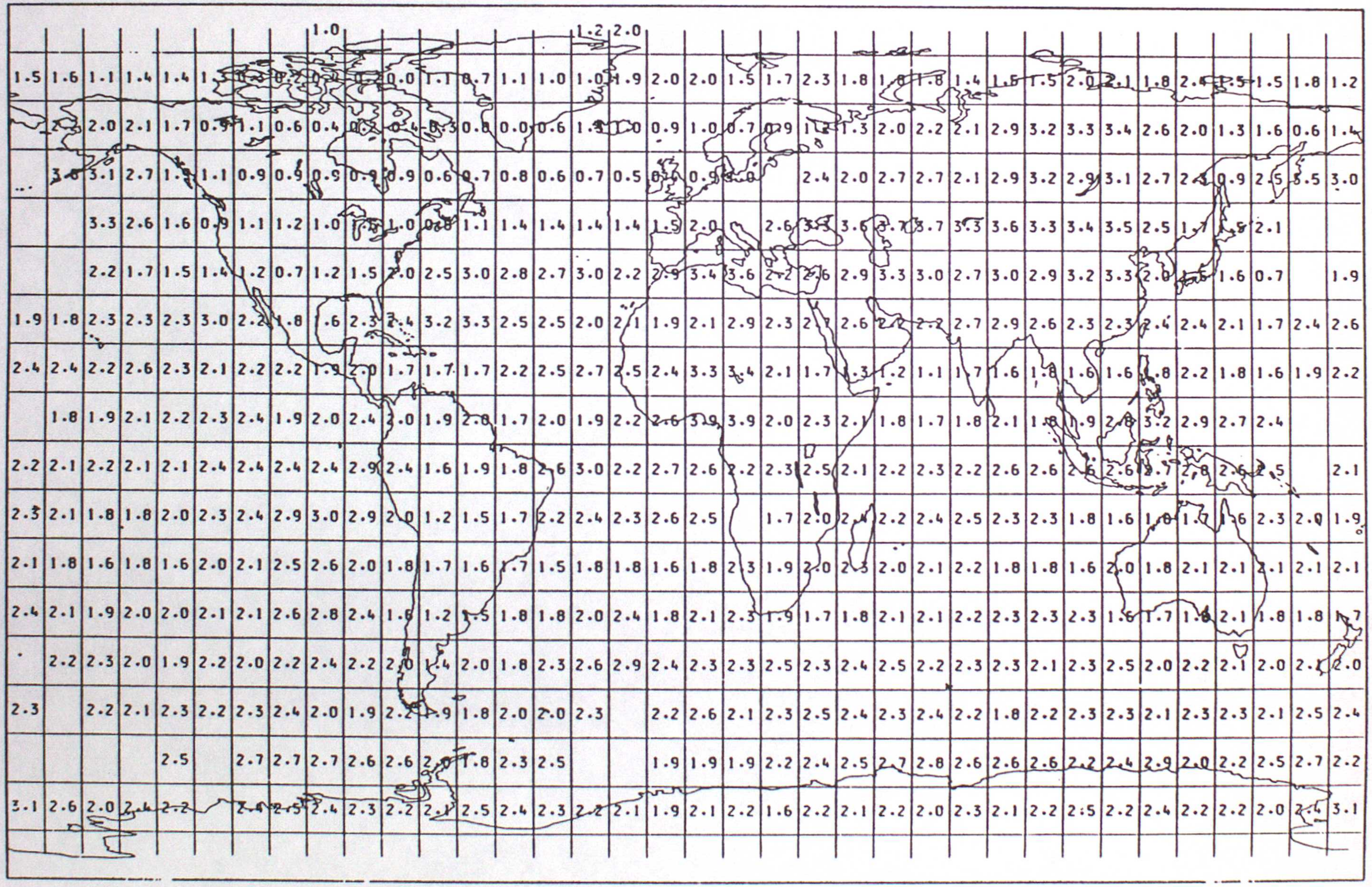

1.0 1.2 2.0
1.5 1.6 1.1 1.4 1.4 1.3 0.2 0.2 0.0 1.1 0.7 1.1 1.0 1.0 1.9 2.0 2.0 1.5 1.7 2.3 1.8 1.8 1.8 1.4 1.5 1.5 2.0 2.1 1.8 2.4 2.5 1.5 1.8 1.2
2.3 2.0 2.1 1.7 0.9 1.1 0.6 0.4 0.2 0.4 0.3 0.0 0.0 0.6 1.3 1.0 0.9 1.0 0.7 0.9 1.2 1.3 2.0 2.2 2.1 2.9 3.2 3.3 3.4 2.6 2.0 1.3 1.6 0.6 1.4
3.0 3.1 2.7 1.9 1.1 0.9 0.9 0.9 0.9 0.9 0.6 0.7 0.8 0.6 0.7 0.5 0.6 0.9 1.0 2.4 2.0 2.7 2.7 2.1 2.9 3.2 2.9 3.1 2.7 2.4 0.9 2.5 3.5 3.0
3.3 2.6 1.6 0.9 1.1 1.2 1.0 1.5 1.0 0.8 1.1 1.4 1.4 1.4 1.4 1.5 2.0 2.6 3.3 3.6 3.7 3.7 3.3 3.6 3.3 3.4 3.5 2.5 1.7 1.5 2.1
2.2 1.7 1.5 1.4 1.2 0.7 1.2 1.5 2.0 2.5 3.0 2.8 2.7 3.0 2.2 2.9 3.4 3.6 2.2 2.6 2.9 3.3 3.0 2.7 3.0 2.9 3.2 3.3 2.0 1.5 1.6 0.7 1.9
1.9 1.8 2.3 2.3 2.3 3.0 2.2 1.8 1.6 2.3 2.4 3.2 3.3 2.5 2.5 2.0 2.1 1.9 2.1 2.9 2.3 2.7 2.6 2.2 2.2 2.7 2.9 2.6 2.3 2.3 2.4 2.4 2.1 1.7 2.4 2.6
2.4 2.4 2.2 2.6 2.3 2.1 2.2 2.2 1.9 2.0 1.7 1.7 1.7 2.2 2.5 2.7 2.5 2.4 3.3 3.4 2.1 1.7 1.3 1.2 1.1 1.7 1.6 1.8 1.6 1.6 1.8 2.2 1.8 1.6 1.9 2.2
1.8 1.9 2.1 2.2 2.3 2.4 1.9 2.0 2.4 2.0 1.9 2.0 1.7 2.0 1.9 2.2 2.6 3.9 3.9 2.0 2.3 2.1 1.8 1.7 1.8 2.1 1.8 1.9 2.8 3.2 2.9 2.7 2.4
2.2 2.1 2.2 2.1 2.1 2.4 2.4 2.4 2.4 2.9 2.4 1.6 1.9 1.8 2.6 3.0 2.2 2.7 2.6 2.2 2.3 2.5 2.1 2.2 2.3 2.2 2.6 2.6 2.6 2.6 2.7 2.8 2.6 2.5 2.1
2.3 2.1 1.8 1.8 2.0 2.3 2.4 2.9 3.0 2.9 2.0 1.2 1.5 1.7 2.2 2.4 2.3 2.6 2.5 1.7 2.0 2.4 2.2 2.4 2.5 2.3 2.3 1.8 1.6 1.8 1.7 1.6 2.3 2.0 1.9
2.1 1.8 1.6 1.8 1.6 2.0 2.1 2.5 2.6 2.0 1.8 1.7 1.6 1.7 1.5 1.8 1.8 1.6 1.8 2.3 1.9 2.0 2.3 2.0 2.1 2.2 1.8 1.8 1.6 2.0 1.8 2.1 2.1 2.1 2.1 2.1
2.4 2.1 1.9 2.0 2.0 2.1 2.1 2.6 2.8 2.4 1.6 1.2 1.5 1.8 1.8 2.0 2.4 1.8 2.1 2.3 1.9 1.7 1.8 2.1 2.1 2.2 2.3 2.3 2.3 1.6 1.7 1.8 2.1 1.8 1.8 1.7
2.2 2.3 2.0 1.9 2.2 2.0 2.2 2.4 2.2 2.0 1.4 2.0 1.8 2.3 2.6 2.9 2.4 2.3 2.3 2.5 2.3 2.4 2.5 2.2 2.3 2.3 2.1 2.3 2.5 2.0 2.2 2.1 2.0 2.1 2.0
2.3 2.2 2.1 2.3 2.2 2.3 2.4 2.0 1.9 2.2 1.9 1.8 2.0 2.0 2.3 2.2 2.6 2.1 2.3 2.5 2.4 2.3 2.4 2.2 1.8 2.2 2.3 2.3 2.1 2.3 2.3 2.1 2.5 2.4
2.5 2.7 2.7 2.7 2.6 2.6 2.0 1.8 2.3 2.5 1.9 1.9 1.9 2.2 2.4 2.5 2.7 2.8 2.6 2.6 2.6 2.2 2.4 2.9 2.0 2.2 2.5 2.7 2.2
3.1 2.6 2.0 2.4 2.2 2.4 2.5 2.4 2.3 2.2 2.1 2.5 2.4 2.3 2.2 2.1 1.9 2.1 2.2 1.6 2.2 2.1 2.2 2.0 2.3 2.1 2.2 2.5 2.2 2.4 2.2 2.2 2.0 2.4 3.1

TABLE 7

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH:December, 93

Monitoring procedures:

Period	:One calendar month.	
Data monitored	:Reports from each unique identifier for drifting buoy.	
Area monitored	:10°N - 80°N, 85°W - 0°W	
Standard of comparison	:Background field from Bracknell global model.	
Position	:Average latitude and longitude for period.	
Observation times	:All hours combined.	
Elements monitored	:Mean sea-level pressure (hPa) Wind speed ($m\ s^{-1}$) Wind direction (degrees)	
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 $m\ s^{-1}$ (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the wind speed > 3 $m\ s^{-1}$.

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13556	30.1	-21.8	ALL	MSLP	SUR	154	0	0	1.3	-0.2	1.3
13561	35.2	-16.6	ALL	MSLP	SUR	154	0	0	1.2	0.1	1.2
25561	71.3	-13.1	ALL	MSLP	SUR	518	3	1	3.6	-0.5	3.6
40504	32.2	-42.3	ALL	MSLP	SUR	1	0	0	0.0	-1.5	1.5
40602	19.1	-37.2	ALL	MSLP	SUR	2	0	0	0.6	0.3	0.7
40603	16.3	-75.3	ALL	MSLP	SUR	1	0	0	0.0	-0.7	0.7
40604	29.7	-45.4	ALL	MSLP	SUR	6	0	0	1.8	-1.0	2.0
40605	26.5	-35.6	ALL	MSLP	SUR	3	0	0	1.1	-1.3	1.7
40607	36.8	-33.0	ALL	MSLP	SUR	1	0	0	0.0	0.7	0.7
40704	28.8	-44.4	ALL	MSLP	SUR	2	0	0	0.0	-0.5	0.6
40708	43.4	-18.5	ALL	MSLP	SUR	2	0	0	0.1	-0.7	0.7
40709	36.0	-70.9	ALL	MSLP	SUR	1	0	0	0.0	-0.7	0.7
40801	20.1	-18.0	ALL	MSLP	SUR	1	0	0	0.0	0.9	0.9
40803	21.7	-48.9	ALL	MSLP	SUR	7	0	0	1.2	-0.6	1.4
40804	12.4	-73.0	ALL	MSLP	SUR	1	0	0	0.0	-3.9	3.9
40805	31.5	-35.8	ALL	MSLP	SUR	2	0	0	0.3	0.1	0.3
40806	41.5	-10.6	ALL	MSLP	SUR	1	0	0	0.0	-0.9	0.9
40808	24.8	-39.5	ALL	MSLP	SUR	2	0	0	0.1	-1.4	1.4
40904	30.9	-33.1	ALL	MSLP	SUR	2	0	0	0.3	-0.9	0.9
41522	26.8	-68.2	ALL	MSLP	SUR	265	0	0	0.9	0.2	1.0
41523	21.4	-74.1	ALL	MSLP	SUR	238	0	0	1.0	0.2	1.0
44515	53.0	-28.1	ALL	MSLP	SUR	361	0	0	2.1	-0.5	2.1
44613	49.3	-20.3	ALL	MSLP	SUR	998	3	0	2.4	-0.3	2.4
44616	53.0	-37.3	ALL	MSLP	SUR	580	73	13	5.3	-4.9	7.2
44624	55.2	-41.0	ALL	MSLP	SUR	1124	9	1	1.8	-0.9	2.0
44726	53.6	-45.9	ALL	MSLP	SUR	1169	45	4	2.8	-0.9	2.9
44728	56.1	-33.6	ALL	MSLP	SUR	1457	2	0	2.0	-0.2	2.0
44765	27.0	-47.8	ALL	MSLP	SUR	284	0	0	0.9	-0.2	1.0
44774	38.8	-32.4	ALL	MSLP	SUR	162	1	1	1.1	-0.2	1.2
44775	43.0	-10.7	ALL	MSLP	SUR	895	0	0	1.7	-0.9	1.9
44777	50.5	-17.0	ALL	MSLP	SUR	1029	1	0	2.2	-0.4	2.3
44778	59.2	-22.0	ALL	MSLP	SUR	1423	0	0	2.4	0.1	2.4
44779	54.4	-25.3	ALL	MSLP	SUR	1171	1	0	2.0	-0.1	2.0
47601	75.6	-6.7	ALL	MSLP	SUR	235	0	0	1.8	-3.4	3.9
47606	61.3	-56.8	ALL	MSLP	SUR	8	5	63	0.4	-0.5	0.6
50604	25.0	-65.0	ALL	MSLP	SUR	1	0	0	0.0	0.1	0.1
62501	43.8	-13.5	ALL	MSLP	SUR	472	0	0	1.1	0.9	1.4
62502	47.2	-12.9	ALL	MSLP	SUR	181	0	0	1.6	0.5	1.7
62514	44.6	-18.4	ALL	MSLP	SUR	236	0	0	1.6	2.2	2.8
62519	43.8	-11.6	ALL	MSLP	SUR	299	0	0	1.1	-0.4	1.2
62520	50.3	-11.8	ALL	MSLP	SUR	359	0	0	1.9	0.7	2.0
62524	39.4	-25.8	ALL	MSLP	SUR	1021	1	0	1.2	0.1	1.2
62601	19.5	-45.8	ALL	MSLP	SUR	255	0	0	1.0	0.0	1.0
62673	66.3	-32.5	ALL	MSLP	SUR	130	1	1	2.0	-0.7	2.1
62694	34.9	-19.1	ALL	MSLP	SUR	598	3	1	3.7	0.6	3.7
62695	38.7	-32.4	ALL	MSLP	SUR	795	3	0	1.4	-0.3	1.4
62711	58.2	-27.6	ALL	MSLP	SUR	1278	4	0	2.3	-0.1	2.3
62712	59.3	-38.6	ALL	MSLP	SUR	1480	1	0	2.1	-0.4	2.1
62805	32.3	-53.5	ALL	MSLP	SUR	138	3	2	1.6	-0.4	1.7
64539	63.8	-31.8	ALL	MSLP	SUR	147	0	0	1.4	0.3	1.5
64580	44.7	-63.6	ALL	MSLP	SUR	40	1	2	1.0	-3.2	3.4
64585	59.6	-40.8	ALL	MSLP	SUR	5	2	40	2.0	-0.1	2.0
64587	62.1	-38.5	ALL	MSLP	SUR	421	0	0	2.5	0.1	2.5
65503	60.9	-25.9	ALL	MSLP	SUR	433	0	0	2.0	1.5	2.5
65506	60.0	-29.6	ALL	MSLP	SUR	375	0	0	2.2	-0.7	2.3
65508	60.0	-37.3	ALL	MSLP	SUR	130	0	0	2.8	0.6	2.9
65581	63.7	-34.2	ALL	MSLP	SUR	1447	2	0	3.2	-1.1	3.4
65592	58.9	-37.1	ALL	MSLP	SUR	775	9	1	2.7	-1.0	2.8
65597	65.0	-34.1	ALL	MSLP	SUR	772	69	9	4.7	-3.6	5.9
95592	58.8	-39.5	ALL	MSLP	SUR	46	0	0	1.8	-0.9	2.0

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND SPEED											
13556	30.1	-21.8	ALL	SPEED	SUR	434	0	0	1.5	-0.3	1.5
13561	35.2	-16.6	ALL	SPEED	SUR	456	0	0	1.7	-0.1	1.7
40504	32.2	-42.3	ALL	SPEED	SUR	1	0	0	0.0	-0.1	0.1
40602	19.1	-37.2	ALL	SPEED	SUR	2	0	0	2.4	1.1	2.7
40603	16.3	-75.3	ALL	SPEED	SUR	1	0	0	0.0	1.8	1.8
40604	29.7	-45.4	ALL	SPEED	SUR	6	0	0	2.1	1.0	2.3
40605	26.5	-35.6	ALL	SPEED	SUR	3	0	0	3.0	1.0	3.2
40607	36.8	-33.0	ALL	SPEED	SUR	1	0	0	0.0	0.6	0.6
40704	28.8	-44.4	ALL	SPEED	SUR	1	0	0	0.0	6.7	6.7
40708	43.4	-18.5	ALL	SPEED	SUR	2	0	0	2.5	5.9	6.4
40709	36.0	-70.9	ALL	SPEED	SUR	1	0	0	0.0	7.3	7.3
40801	20.1	-18.0	ALL	SPEED	SUR	1	0	0	0.0	-2.3	2.3
40803	21.7	-48.9	ALL	SPEED	SUR	7	0	0	1.9	1.0	2.1
40805	31.5	-35.8	ALL	SPEED	SUR	2	0	0	3.3	2.1	4.0
40806	41.5	-10.6	ALL	SPEED	SUR	1	0	0	0.0	-2.0	2.0
40808	24.8	-39.5	ALL	SPEED	SUR	2	0	0	1.3	2.7	3.0
40904	30.9	-33.1	ALL	SPEED	SUR	2	0	0	1.3	5.2	5.4
44614	55.7	-34.0	ALL	SPEED	SUR	6	0	0	1.2	-15.8	15.9
44728	56.1	-33.6	ALL	SPEED	SUR	1003	0	0	2.4	-2.8	3.7
50604	25.0	-65.0	ALL	SPEED	SUR	1	0	0	0.0	1.2	1.2
62502	47.2	-12.9	ALL	SPEED	SUR	536	0	0	1.7	-1.3	2.2
62520	50.3	-11.8	ALL	SPEED	SUR	172	0	0	4.8	-4.5	6.6
62695	38.7	-32.4	ALL	SPEED	SUR	697	1	0	1.9	-3.2	3.8
62712	59.3	-38.6	ALL	SPEED	SUR	851	0	0	3.5	-1.6	3.9
WIND DIRECTION											
13556	30.1	-21.8	ALL	DIRN.	SUR	369	0	0	14.9	3.7	15.4
13561	35.2	-16.6	ALL	DIRN.	SUR	265	0	0	12.7	-3.8	13.3
40504	32.2	-42.3	ALL	DIRN.	SUR	1	0	0	0.0	-10.8	10.8
40603	16.3	-75.3	ALL	DIRN.	SUR	1	0	0	0.0	17.6	17.6
40604	29.7	-45.4	ALL	DIRN.	SUR	5	0	0	27.8	-2.0	27.9
40605	26.5	-35.6	ALL	DIRN.	SUR	3	0	0	22.4	4.7	22.9
40607	36.8	-33.0	ALL	DIRN.	SUR	1	0	0	0.0	-44.4	44.4
40704	28.8	-44.4	ALL	DIRN.	SUR	1	0	0	0.0	33.9	33.9
40708	43.4	-18.5	ALL	DIRN.	SUR	2	0	0	21.7	-29.4	36.5
40709	36.0	-70.9	ALL	DIRN.	SUR	1	0	0	0.0	9.6	9.6
40801	20.1	-18.0	ALL	DIRN.	SUR	1	0	0	0.0	35.7	35.7
40803	21.7	-48.9	ALL	DIRN.	SUR	7	0	0	31.5	-4.3	31.8
40805	31.5	-35.8	ALL	DIRN.	SUR	2	0	0	26.4	24.9	36.3
40806	41.5	-10.6	ALL	DIRN.	SUR	1	0	0	0.0	-16.1	16.1
40808	24.8	-39.5	ALL	DIRN.	SUR	2	0	0	3.2	3.7	4.9
40904	30.9	-33.1	ALL	DIRN.	SUR	2	0	0	11.4	6.4	13.1
44614	55.7	-34.0	ALL	DIRN.	SUR	6	0	0	7.4	89.5	89.8
44728	56.1	-33.6	ALL	DIRN.	SUR	963	0	0	24.3	12.2	27.2
50604	25.0	-65.0	ALL	DIRN.	SUR	1	0	0	0.0	29.0	29.0
62502	47.2	-12.9	ALL	DIRN.	SUR	518	0	0	13.6	-9.1	16.3
62520	50.3	-11.8	ALL	DIRN.	SUR	172	0	0	37.7	-2.7	37.8
62695	38.7	-32.4	ALL	DIRN.	SUR	613	1	0	24.2	-9.7	26.1
62712	59.3	-38.6	ALL	DIRN.	SUR	717	0	0	43.1	-1.5	43.1

TABLE 8

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:December, 93

Monitoring procedures:
Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in ^{o}C ; WIND in m s^{-1}

Parameters monitored :N REP.:Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 ^{o}C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	497	0	3	1.8	-0.2	506	0	3	0	9.6	1.3
ACA	299	1	3	2.4	-0.4	311	0	3	0	9.0	0.8
AEA	65	2	5	2.3	-0.4	66	0	5	0	13.1	-1.0
AEL	119	2	5	2.4	-0.5	124	0	4	0	9.0	0.7
AFL	82	2	100	3.0	1.4	82	1	100	0	19.6	1.3
AFR	275	1	10	2.2	-0.2	288	0	9	0	10.3	0.4
AMX	121	2	3	2.0	0.2	122	0	6	1	10.0	1.2
ANZ	120	2	10	2.3	-0.8	120	0	7	0	7.1	1.1
AOM	111	1	2	2.4	0.4	118	0	4	0	10.5	0.6
AUA	26	0	100	2.7	-1.4	26	0	0	0	5.2	0.4
AVA	110	3	5	2.3	0.1	111	1	7	0	11.5	0.8
AZA	293	0	2	2.1	0.5	297	0	4	0	10.3	1.5
BAL	42	0	12	1.9	-0.6	43	0	14	0	11.7	-1.2
BAW	352	1	9	1.8	0.1	358	0	8	0	8.6	1.1
BWA	84	0	1	2.0	1.3	88	1	5	0	9.3	0.7
CDN	212	0	8	1.9	0.7	212	0	8	0	7.3	1.3
CFG	273	0	3	2.1	-1.0	276	0	4	0	9.5	0.0
COA	123	1	5	2.4	0.4	123	1	6	1	10.6	1.4
CRL	27	4	0	1.1	0.3	29	0	3	0	8.6	0.6
CUB	20	5	100	3.5	0.4	20	0	20	0	15.5	3.0
DAE	28	0	0	1.9	0.3	28	0	0	0	7.6	1.9
DAL	968	0	2	2.0	-0.1	971	0	3	0	8.5	1.0
DHL	103	1	8	3.4	-0.9	105	0	6	0	12.7	2.1
DLH	998	0	10	2.0	-0.1	1001	0	11	1	8.0	0.7
DOA	28	4	7	2.1	-0.6	28	0	7	0	7.2	0.4
EIA	103	12	25	3.9	-1.9	108	0	14	0	12.6	2.3
ELY	55	2	9	1.5	0.5	60	0	10	0	11.9	2.2
FDX	254	1	7	1.9	0.6	258	0	8	0	8.3	0.7
FIN	240	0	1	1.8	0.6	240	0	1	0	7.7	1.1
HLF	59	2	5	2.1	-0.8	60	0	0	0	8.6	2.0
IBE	587	2	19	2.4	0.0	589	0	19	0	10.8	0.2
ICE	280	0	2	2.0	0.3	280	0	2	0	8.0	0.8
KLM	732	0	2	2.0	0.3	739	0	1	0	8.4	1.1
LDA	101	1	11	1.7	-1.2	103	0	12	0	8.7	-0.5
LDI	51	0	8	2.3	-1.7	51	0	6	0	10.2	-0.1
LIB	26	0	0	1.9	-0.1	26	0	4	0	9.6	3.3
LOT	188	1	1	1.8	0.3	187	0	2	0	7.2	0.5
LTU	264	3	6	2.6	0.4	267	0	4	0	10.6	1.3
MAH	40	0	0	1.6	-0.2	41	0	0	0	7.8	0.5
MPH	179	0	3	2.0	0.0	184	0	4	1	10.4	1.1
NWA	1503	0	2	2.1	0.9	1543	0	3	0	9.1	1.0
RRR	25	0	24	2.2	0.5	27	0	33	4	13.0	3.4
SAS	1002	0	1	1.8	0.0	998	0	1	1	7.4	0.4
SIA	22	5	9	2.7	-0.8	24	0	8	0	12.9	0.4
SPP	40	0	0	1.4	-0.3	39	0	0	0	9.9	0.6
SVA	56	0	2	1.6	0.4	61	0	5	0	10.6	-0.3
SWR	25	4	16	1.6	0.1	26	0	12	0	8.6	2.4
TAP	238	2	5	2.2	-0.7	239	0	5	0	10.8	0.6
TOW	60	2	7	2.2	0.3	61	0	8	0	9.1	1.4
TWA	463	1	2	2.1	0.8	464	0	2	0	10.3	1.2
UAL	696	1	2	2.3	0.0	713	0	3	2	9.0	0.7
ULE	102	0	0	1.8	0.0	106	0	2	0	7.6	0.0
UPS	217	0	18	1.8	-0.2	219	0	18	0	9.5	0.8
VIA	47	0	11	2.2	1.1	48	2	10	0	9.6	2.2
BA	6121	0	8	1.9	0.6	6101	1	7	1	11.8	1.7
KL	1210	0	96	2.9	2.4	1204	0	6	0	12.1	1.9
LH	90	0	1	2.0	0.7	90	0	4	0	9.6	2.0
NW	21	0	0	2.1	-0.8	21	0	0	0	5.7	2.2
M	52	2	100	2.7	0.3	52	0	6	0	9.7	-0.4
N	71	4	4	2.6	1.0	73	0	4	0	10.5	-1.0

TABLE 9

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:December, 93

Monitoring procedures:

Period	:One calendar month.	
Data monitored	:Reports from each unique identifier for radiosonde TEMPs.	
Area monitored	:0°N - 90°N, 100°W - 40°E	
Standard of comparison	:Background field from Bracknell global model.	
Position	:Average latitude and longitude for period.	
Observation times	:00, 12 UTC.	
Level monitored	:100 hPa.	
Element monitored	:GEOPOTENTIAL HEIGHT in metres	
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.1	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
FNOR	00	Z	100	2	0	13.5	20.6	-15.5
FNOR	12	Z	100	3	0	20.5	20.7	2.3
FNOU	00	Z	100	13	0	25.1	28.7	13.8
FNOU	12	Z	100	12	0	20.9	23.6	10.8
FNPH	00	Z	100	11	0	18.0	21.1	-11.0
FNPH	12	Z	100	14	0	17.0	27.5	-21.6
FNRS	00	Z	100	7	0	20.0	31.5	-24.3
FNRS	12	Z	100	14	0	24.1	27.7	-13.5
GACA	00	Z	100	29	0	28.2	31.4	13.7
GACA	12	Z	100	29	0	19.3	28.4	20.9
LDWR	00	Z	100	31	0	19.6	23.8	13.5
LDWR	12	Z	100	28	0	17.9	23.1	14.6
OVYA	00	Z	100	10	0	70.8	78.6	34.2
OVYA	12	Z	100	9	0	31.3	38.6	22.6
OZJP	00	Z	100	9	0	38.7	40.4	-11.9
OZJP	12	Z	100	7	0	18.7	27.7	20.4
P3004	00	Z	100	23	0	18.7	28.0	-20.9
P3004	12	Z	100	20	0	26.1	27.9	9.8
S	00	Z	100	1	0	0.0	7.0	7.0
SHIP	00	Z	100	1	0	0.0	15.0	15.0
UQYC	00	Z	100	9	0	10.9	11.0	1.3
UQYC	12	Z	100	1	0	0.0	21.0	21.0
V2LV	00	Z	100	22	0	20.4	22.6	-9.6
V2LV	12	Z	100	27	0	21.0	23.2	-10.0
V2LX	00	Z	100	23	0	23.7	23.8	-1.7
V2LX	12	Z	100	21	0	30.9	36.0	18.5
ZCAW6	00	Z	100	20	0	24.6	24.7	-1.6
ZCAW6	12	Z	100	21	0	21.5	22.9	8.0
03953	00	Z	100	18	0	23.6	32.7	22.7
03953	12	Z	100	22	0	20.5	39.5	33.8
04018	00	Z	100	27	0	19.7	30.6	23.4
04018	12	Z	100	28	1	17.6	35.8	31.2
04220	00	Z	100	29	0	18.7	31.2	25.0
04220	12	Z	100	31	0	13.6	32.8	29.9
04270	00	Z	100	29	0	23.5	39.7	32.0
04270	12	Z	100	29	0	23.6	35.4	26.4
04339	00	Z	100	30	0	15.2	21.5	15.2
04339	12	Z	100	31	0	16.2	27.2	21.8
04360	00	Z	100	29	0	19.8	26.4	17.4
04360	12	Z	100	29	0	21.1	30.6	22.2
08001	00	Z	100	28	0	21.3	35.1	27.9
08001	12	Z	100	28	0	18.6	32.3	26.4
08508	00	Z	100	29	0	19.3	19.7	-4.1
08508	12	Z	100	30	0	18.0	18.1	1.6
08594	12	Z	100	15	0	23.4	23.4	0.3
60020	00	Z	100	28	0	23.9	24.4	-4.9
60020	12	Z	100	28	1	26.2	26.7	4.8
71600	00	Z	100	29	0	25.7	26.4	6.2
71600	12	Z	100	21	0	20.7	24.1	12.2
72201	00	Z	100	30	0	21.7	27.7	17.2
72201	12	Z	100	29	0	28.6	34.3	19.0
72304	00	Z	100	27	0	26.7	32.4	18.4
72304	12	Z	100	26	1	27.2	30.2	13.1
72402	00	Z	100	25	0	16.2	25.8	20.1
72402	12	Z	100	30	0	22.6	27.7	16.0
72606	00	Z	100	28	0	19.1	19.5	-3.8
72606	12	Z	100	30	0	18.7	20.3	-7.8
74494	00	Z	100	26	0	32.7	34.9	-12.1
74494	12	Z	100	25	0	22.7	24.4	-8.9
78016	12	Z	100	10	0	26.4	30.4	15.2

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:December, 93

Monitoring procedures:

Period	:One calendar month.	
Data monitored	:Reports from each unique identifier for radiosonde TEMPs.	
Area monitored	:0°N - 90°N, 100°W - 40°E	
Standard of comparison	:Background field from Bracknell global model.	
Position	:Average latitude and longitude for period.	
Observation times	:00, 12 UTC.	
Level monitored	:500 hPa.	
Element monitored	:GEOPOTENTIAL HEIGHT in metres	
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.1	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
FNOR	00	Z	500	2	0	2.5	3.5	-2.5
FNOR	12	Z	500	3	0	23.3	23.9	5.3
FNOU	00	Z	500	13	0	11.6	17.0	12.4
FNOU	12	Z	500	12	0	11.8	13.0	5.6
FNPH	00	Z	500	14	0	12.5	13.5	-5.2
FNPH	12	Z	500	16	0	13.7	14.3	-4.1
FNRS	00	Z	500	12	0	13.8	14.4	-4.0
FNRS	12	Z	500	15	0	8.2	10.2	-6.0
GACA	00	Z	500	29	0	16.5	16.9	3.5
GACA	12	Z	500	28	0	19.8	20.6	5.9
LDWR	00	Z	500	31	0	15.6	20.8	13.7
LDWR	12	Z	500	26	0	11.9	17.7	13.2
OVYA	00	Z	500	10	0	17.5	17.6	1.2
OVYA	12	Z	500	10	0	24.4	25.2	-6.3
OZJP	00	Z	500	9	0	32.1	36.1	-16.6
OZJP	12	Z	500	7	0	15.3	17.2	-7.9
P3OO4	00	Z	500	24	0	11.8	11.9	-1.5
P3OO4	12	Z	500	21	0	12.8	13.0	2.2
S	00	Z	500	1	0	0.0	6.0	6.0
SHIP	00	Z	500	1	0	0.0	25.0	-25.0
SHIP	12	Z	500	1	0	0.0	4.0	-4.0
UQYC	00	Z	500	9	0	14.1	16.6	8.8
UQYC	12	Z	500	1	0	0.0	2.0	-2.0
V2LV	00	Z	500	26	0	13.7	14.6	5.1
V2LV	12	Z	500	30	0	19.0	19.1	1.1
V2LX	00	Z	500	24	0	8.4	8.7	2.0
V2LX	12	Z	500	21	0	12.0	12.1	-0.8
WTES	00	Z	500	1	0	0.0	7.0	-7.0
ZCAW6	00	Z	500	20	0	15.5	17.7	-8.4
ZCAW6	12	Z	500	20	0	13.7	15.5	-7.3
03953	00	Z	500	30	0	17.2	18.8	7.6
03953	12	Z	500	31	0	15.7	19.2	11.1
04018	00	Z	500	30	0	15.5	17.4	8.0
04018	12	Z	500	31	0	14.6	20.3	14.1
04220	00	Z	500	29	0	18.5	18.8	3.0
04220	12	Z	500	31	0	11.7	15.6	10.3
04270	00	Z	500	30	0	18.2	22.2	12.8
04270	12	Z	500	30	0	13.3	16.3	9.4
04339	00	Z	500	30	0	15.3	18.8	11.0
04339	12	Z	500	31	0	18.4	21.4	10.8
04360	00	Z	500	29	0	16.8	17.2	3.8
04360	12	Z	500	30	0	15.1	17.9	9.6
08001	00	Z	500	28	0	15.9	26.5	21.1
08001	12	Z	500	28	0	17.0	20.3	11.2
08508	00	Z	500	29	0	11.5	12.5	5.0
08508	12	Z	500	30	0	13.1	13.6	3.6
08594	12	Z	500	17	0	12.7	12.9	2.5
60020	00	Z	500	28	0	14.5	15.2	4.6
60020	12	Z	500	28	1	12.9	16.6	10.4
71600	00	Z	500	30	0	13.5	14.3	4.8
71600	12	Z	500	31	0	14.5	14.6	-2.2
72201	00	Z	500	30	0	8.1	11.5	8.2
72201	12	Z	500	31	0	8.7	10.1	5.2
72304	00	Z	500	29	0	21.9	21.9	0.3
72304	12	Z	500	31	0	15.3	15.7	3.2
72402	00	Z	500	30	0	12.9	14.9	7.5
72402	12	Z	500	31	0	11.7	14.3	8.2
72606	00	Z	500	30	0	12.6	12.8	2.4
72606	12	Z	500	30	0	12.2	12.5	2.7
74494	00	Z	500	29	0	25.5	26.1	-5.4
74494	12	Z	500	31	0	10.2	10.3	-1.5
78016	12	Z	500	25	0	13.3	19.8	14.7

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:December, 93

Monitoring procedures:

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :100 hPa.

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:UBIAS, VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
FNOR	00	V	100	2	0	0	4.0	-4.3	-0.7
FNOR	12	V	100	3	0	0	4.0	-2.7	-1.4
FNOU	00	V	100	13	0	0	4.0	-0.5	-1.3
FNOU	12	V	100	12	0	0	4.3	1.1	-1.0
FNPH	00	V	100	11	0	0	4.1	-1.7	-0.5
FNPH	12	V	100	14	0	0	3.9	-0.7	-0.6
FNRS	00	V	100	7	0	0	3.8	-2.4	-1.9
FNRS	12	V	100	13	0	0	3.8	-2.2	-0.8
GACA	00	V	100	28	0	0	4.8	-1.4	0.3
GACA	12	V	100	29	0	0	3.6	-1.9	-1.2
LDWR	00	V	100	31	0	0	3.2	0.0	-1.1
LDWR	12	V	100	28	0	0	2.7	-0.2	-1.3
OVYA	00	V	100	9	0	0	2.5	0.4	0.0
OVYA	12	V	100	9	0	0	2.5	2.5	-1.1
OZJP	00	V	100	9	0	0	2.5	-0.5	1.1
OZJP	12	V	100	7	0	0	2.5	-1.8	1.4
P3OO4	00	V	100	23	0	0	2.5	1.4	-0.7
P3OO4	12	V	100	20	0	0	4.5	0.2	0.1
SHIP	00	V	100	1	0	0	4.6	0.6	-1.4
UQYC	00	V	100	9	0	0	4.6	1.5	1.3
UQYC	12	V	100	1	0	0	4.1	-0.1	-1.7
V2LV	00	V	100	22	0	0	4.1	1.2	1.9
V2LV	12	V	100	27	0	0	5.4	-0.2	1.1
V2LX	00	V	100	22	0	0	4.1	2.5	-0.3
V2LX	12	V	100	20	0	0	6.5	1.0	0.6
ZCAW6	00	V	100	19	0	0	5.5	-1.5	0.3
ZCAW6	12	V	100	21	0	0	2.2	-2.5	-0.7
03953	00	V	100	16	0	0	3.1	-2.3	1.6
03953	12	V	100	22	0	0	4.6	-2.8	-0.8
04018	00	V	100	24	0	0	3.6	0.5	0.0
04018	12	V	100	29	0	0	2.7	0.4	-1.0
04220	00	V	100	29	0	0	2.3	1.8	0.7
04220	12	V	100	31	0	0	2.0	1.4	0.2
04270	00	V	100	28	0	3	2.7	0.0	0.6
04270	12	V	100	29	0	3	4.3	-2.8	-0.2
04339	00	V	100	30	0	0	2.1	1.2	-0.3
04339	12	V	100	31	0	0	3.0	0.2	-1.1
04360	00	V	100	29	0	0	2.6	0.6	-0.1
04360	12	V	100	30	0	0	2.6	-0.3	-0.9
08001	00	V	100	26	0	0	5.3	-1.5	2.1
08001	12	V	100	27	0	0	4.9	-2.6	1.1
08508	00	V	100	29	0	0	4.1	-0.2	-0.5
08508	12	V	100	31	0	0	3.9	-0.9	-0.2
08594	12	V	100	14	0	0	5.1	2.5	1.5
60020	00	V	100	28	0	0	4.5	0.7	0.6
60020	12	V	100	29	0	0	4.5	-1.2	1.9
71600	00	V	100	29	0	3	3.7	-1.7	0.0
71600	12	V	100	20	0	0	6.2	-0.6	0.4
72201	00	V	100	28	0	0	3.7	1.8	-0.2
72201	12	V	100	28	0	0	4.5	2.2	0.1
72304	00	V	100	21	0	0	4.4	-1.2	1.6
72304	12	V	100	22	0	0	5.1	-1.7	2.2
72402	00	V	100	22	0	0	3.9	-0.7	0.8
72402	12	V	100	27	0	0	3.7	-0.9	0.7
72606	00	V	100	22	0	0	3.7	-1.4	1.1
72606	12	V	100	24	0	0	3.1	-0.4	0.8
74494	00	V	100	25	0	0	3.8	-2.0	1.4
74494	12	V	100	23	0	0	2.8	-0.2	1.4
78016	12	V	100	7	0	0	5.2	-3.4	2.0

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:December, 93

Monitoring procedures:

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :500 hPa.

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:UBIAS, VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
FNOR	00	V	500	2	0	0	3.7	-2.6	-0.9
FNOR	12	V	500	3	0	0	3.7	1.3	-1.8
FNOU	00	V	500	13	0	0	3.7	0.9	-1.5
FNOU	12	V	500	11	0	0	2.3	-0.9	-2.1
FNPH	00	V	500	14	0	0	1.7	-0.4	-0.3
FNPH	12	V	500	16	0	0	3.4	-1.0	1.0
FNRS	00	V	500	12	0	0	3.7	-0.7	1.2
FNRS	12	V	500	15	0	0	2.0	-0.7	0.7
GACA	00	V	500	29	0	0	3.7	1.5	1.1
GACA	12	V	500	27	0	0	4.2	-0.9	0.4
LDWR	00	V	500	31	0	0	4.9	0.6	0.7
LDWR	12	V	500	24	1	8	3.6	0.5	9.2
OVYA	00	V	500	10	0	10	3.6	-3.0	2.6
OVYA	12	V	500	10	0	0	4.4	-0.2	-0.2
OZJP	00	V	500	9	0	0	2.9	0.4	1.8
OZJP	12	V	500	7	0	0	2.9	-0.7	2.9
P3OO4	00	V	500	23	0	0	2.9	0.1	1.9
P3OO4	12	V	500	21	0	0	2.3	-1.9	-0.3
S	00	V	500	1	0	0	3.5	2.7	-2.2
SHIP	00	V	500	1	0	100	3.5	0.5	0.9
SHIP	12	V	500	1	0	0	3.5	-2.3	0.6
UQYC	00	V	500	9	0	0	3.5	-0.2	2.2
UQYC	12	V	500	1	0	0	4.2	-0.1	0.6
V2/X	00	V	500	1	0	100	4.2	-8.9	-40.1
V2LV	00	V	500	26	0	0	4.2	1.0	-0.2
V2LV	12	V	500	30	0	0	4.3	-0.4	0.8
V2LX	00	V	500	24	0	0	3.8	-0.6	-0.1
V2LX	12	V	500	21	0	0	3.0	-1.9	-0.4
WTES	00	V	500	1	0	0	3.2	0.7	0.5
ZCAW6	00	V	500	20	0	0	4.6	1.7	-0.3
ZCAW6	12	V	500	20	0	0	3.7	0.3	2.3
03953	00	V	500	30	0	0	5.7	0.5	2.2
03953	12	V	500	31	0	0	5.3	0.5	0.6
04018	00	V	500	30	0	0	5.4	-0.2	0.8
04018	12	V	500	31	0	0	3.8	-1.2	-0.2
04220	00	V	500	29	0	0	4.0	-0.5	0.3
04220	12	V	500	31	0	0	4.8	0.2	0.5
04270	00	V	500	29	0	0	3.3	-0.2	0.0
04270	12	V	500	30	0	6	5.4	-3.0	-1.6
04339	00	V	500	30	0	0	4.3	-0.9	1.1
04339	12	V	500	31	0	0	4.4	0.3	-0.5
04360	00	V	500	29	0	0	3.6	-0.8	-0.2
04360	12	V	500	30	0	0	4.7	-1.3	-0.9
08001	00	V	500	28	0	3	5.6	1.6	0.7
08001	12	V	500	28	0	0	4.1	0.7	0.3
08508	00	V	500	29	0	0	4.3	1.7	0.7
08508	12	V	500	30	0	0	4.9	-1.4	-0.1
08594	12	V	500	17	0	5	3.4	-3.6	-1.4
60020	00	V	500	28	0	0	3.0	-1.8	0.0
60020	12	V	500	29	0	0	4.0	-2.3	-0.5
71600	00	V	500	30	0	0	4.8	-0.7	1.9
71600	12	V	500	29	0	0	3.9	-0.2	1.2
72201	00	V	500	29	0	0	4.8	0.2	1.0
72201	12	V	500	31	0	0	2.9	-0.6	1.2
72304	00	V	500	29	0	0	4.3	-0.7	1.1
72304	12	V	500	29	0	0	3.3	-1.2	1.1
72402	00	V	500	30	0	0	3.8	-0.6	0.0
72402	12	V	500	30	0	0	3.2	0.8	1.3
72606	00	V	500	29	0	0	4.0	-1.5	0.5
72606	12	V	500	29	0	0	3.4	-0.9	-0.2
74494	00	V	500	29	0	0	4.1	-0.9	1.3
74494	12	V	500	30	0	0	4.4	-0.9	1.1
78016	12	V	500	25	0	0	3.5	0.7	1.3

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Table 4 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 4 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Table 5 are:-

Level (hPa)	Windspeed $m\ s^{-1}$
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45